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PROCEEDINGS

OF

THE SUB-COMMITTEE,

PUBLIC SERVICE COMMISSION.

INDIA.
Mint.

Section I.—Note by the Sub-Committee.

The Indian Mints consist of two Departments—the Mechanical Department or Mint proper, and the Assay Department.

The officers in the Mechanical Department of the Calcutta and Bombay Mints in the enjoyment of salaries of ₹100 and upwards, are shown in the following table :—

		Europeans.	Europeans domiciled in India.	Eurasians.	Hindus.	Mahommedans.	Parsis.
Calcutta.	₹						
Master of the Mint, gazetted	3,000	1	...	...	...	...	...
Head Mechanical Engineer	500—600	1	...	...	...	...	...
2 Engineers, 1st grade	300—400	2	...	...	...	...	...
2 „ 2nd „	250—300	2	...	...	...	...	...
2 „ 3rd „	200—250	1	1	...	...	...	...
First-grade Apprentice	100—150	...	...	1	...	...	...
Melter, 1st grade	450	...	...	1	...	...	...
„ 2nd „	300	...	...	1	...	...	...
„ 3rd „	200	...	...	1	...	...	...
„ 4th „	100	...	...	1	...	...	...
1st Assistant to Mint Master	450—600	1	...	...	...	...	...
2nd „ „	450	...	...	1	...	...	...
3rd „ „	300	...	...	1	...	...	...
4th „ „	150	...	...	1	...	...	...
Bullion-Keeper	500	...	...	...	1	...	...
Deputy Bullion-Keeper	200	...	...	...	1	...	...
Bullion Superintendent	100	...	...	...	1	...	...
Engraver	500—600	1	...	...	...	...	...
Assistant Engraver	100	...	...	...	1	...	...
Warder	200	1	...	...	...	...	...
TOTAL		10	1	8	4	...	...
Bombay.	₹						
Master of the Mint, gazetted	3,000	1	...	...	...	...	...
Foreman	500—700	1	...	...	...	...	...
Superintendent, Rolling Department	350—450	...	...	1	...	...	...
Assistant Superintendent, Rolling Department	140—200	1	...	...	...	...	...
2 Superintendents, Coining Department	380—450	2	...	...	...	...	...
Assistant Superintendent, Coining Department	80—120	...	1	...	...	...	...
Superintendent, Engine Department	250—350	...	...	1	...	...	...
„ General Workshop	250—350	...	1	...	...	...	...
„ Adjusting Department	250—350	1	...	...	...	...	...
„ Weighing Department	250—350	1	...	...	...	...	...
Melter	450—500	...	...	1	...	...	...
Assistant Melter	250—350	1	...	...	...	...	...
2nd Assistant Melter	140—200	...	1	...	...	...	...
Assistant to Mint Master	600—800	...	1	...	...	...	...
Bullion-Keeper	250	...	...	...	...	...	1
Bullion-Keeper, Mechanical Department	300	...	...	...	...	1	...
Deputy Bullion-Keeper, Mechanical Department	160	...	...	...	1	...	...
Engraver	90	...	...	...	1	...	...
with Travelling Allowance	60						
Warder	150	...	1	...	...	...	...
TOTAL		8	5	3	2	1	1

The Masters of the Mint are officers of the Royal Engineer Corps.

The Head Engraver at the Calcutta Mint is a Belgian. His services were obtained from Europe, inasmuch as it was necessary to obtain an officer who was capable of designing as well as of engraving. The Master of the Bombay Mint spoke highly of the ability of the Hindu Engraver, and anticipated difficulty in finding so competent an artist to take his place. It is noteworthy that the Bullion-Keepers at both Mints are Natives, but at the Calcutta Mint the First Assistant has joint charge of the bullion and checks every transaction entailing the receipt, transfer, or issue of bullion. The Bullion-Keeper in Calcutta, a Hindu, furnishes security to the amount of ₹1,50,000, the Bullion-Keeper at Bombay, a Parsi, to the amount of ₹25,000. With the exception of the Bullion officers, the Engraver at Bombay, the Assistant Engraver at Calcutta, and certain office clerks, no Native holds an appointment in either Mint of which the salary amounts to ₹100.

The appointments and promotions of all non-gazetted officers in this branch of the Mint are made by the Mint Master. The officers are entitled to the benefit of the leave and pension rules applicable to Uncovenanted Servants under the Codes. The Mint Master, Bombay, in his Departmental note, observes: "It is scarcely to be expected that a European serving in the Melting or Mechanical Departments of the Mint can qualify for his retiring pension; only one European Engineer has, I believe, ever done it." In view of the unhealthiness of the employment, he urges that a Mint Engineer should be allowed to claim a retiring pension after 25 years' and an invalid pension after 22 years' service.

The Mint Master at Calcutta attended the meeting of the Sub-Committee and stated his views, and it was thought unnecessary to invite him to furnish them in writing. He considers it desirable that the First Assistant should be a European by race if the Bullion-Keeper is a Native, and he thinks that only a Native could furnish the security required from a Bullion-Keeper, but except where the employment of men of two races to check one another conduces to the security of the large interests with which the Department is charged, he is of opinion that no reason exists for any race disqualification in respect of offices in the Department, provided the possession of adequate technical knowledge and probity is assured. In explanation of the employment of Europeans and Eurasians in the better posts, he states that he has been unable to find qualified men in India, and that it has been necessary to recruit about one-half of the Engineers in England. He expresses his willingness to engage men in India if he can find them sufficiently qualified.

Major-General White, the Mint Master of Bombay, in his Departmental note, states that promotion among the men employed in the Department generally goes by seniority, unless a man has shown himself unfit for it. He considers that, excluding mechanics, a high standard of educational qualification is not necessary for service in the Mint; that what is required is a steady, plodding man of good character and of no very high aspirations; that the sphere is small and the pay not large, and that if men of greater ability or higher education were appointed to such posts, the Mint establishment would be subject to constant changes, which, for obvious reasons, would be objectionable. He states that the Assistants in the Bullion Department are generally promoted in their own department; but that men are shifted from the office to the Bullion Department and from the Bullion Department to the office whenever it is considered desirable. The Bullion-Keeper in the Mechanical Department must, in his opinion, be both intelligent and energetic, and must be selected from Assistants who have had long experience in the office, as the work is intricate. He mentions that he had formerly had a Hindu Mechanical Bullion-Keeper, who was a man of great force of character and extraordinary energy, that the present Mechanical Bullion-Keeper is a Mahomedan and a very suitable man for the post, and that he would like to see more Mahomedans in the Mint, as they are generally reliable and energetic and make themselves obeyed and respected by their subordinates, but that few of them apply for employment; on the other hand, the Bullion-Keeper, who is in charge of the bullion received from bankers and merchants, would, he thinks, be generally selected from persons outside the Department, as few of the Assistants could provide the security required—₹25,000. During his tenure of office there had been three Bullion-Keepers—one Hindu and two Parsis; he considered that the Hindu shrank from the responsibility of so large a charge, while the Parsis set to work more calmly, and have, perhaps, greater energy. The appointment of Assistant Mint Master is, he states, generally filled by promotion in the office, but when, as recently happened, the Accountant, the next officer in rank, has not been long in his office, an officer would be brought in from outside: and he explains that for this reason an officer from the Public Works Account Branch had recently been appointed to act in this post.

With regard to the Mechanical Department, Major-General White considers it absolutely necessary that there should be a good proportion of European-trained Engineers—men with force of character and a high sense of duty. He states that the Head Mechanical Engineers would always be promoted from the Superintendents, and that the Superintendents would generally be promoted from Engineers in the Department; but inasmuch as it is necessary that there should be a good proportion of Engineers trained in Europe, men were occasionally brought into the Department to fill these posts; that two Superintendents—one of whom had served in the Indian Navy and the other in the Peninsular and Oriental Company's service—had been so brought in, and that three had risen from the position of apprentice in the Department. He states that of ten Mechanical Engineers, two had been sent out by the Secretary of State, five had been recruited in India, and three had been trained

as apprentices in the Mint. He considers that Engineers trained in Europe are as a class superior to Engineers trained in India, as the latter labour under two disadvantages, *viz.*, the climate saps their energy, and they have not the opportunity of gaining varied experience, whereas the work in England is hard and conducted in an orderly and systematic manner, and affords a mechanic much larger opportunities of learning than are afforded to a man brought up in Bombay, whose whole experience is perhaps limited to a single workshop. The Mint Master states that Natives do not apply for these appointments, but he does not doubt that in time Natives, probably Parsis, will do so, as they are an energetic class with a fair amount of mechanical aptitude, and are willing to put themselves to inconvenience to obtain experience. For the present, he considers it necessary in the interests of Government to retain one-half of the Engineering appointments in the Mint for men trained in Europe.

Major-General White was so good as to give further information to the Sub-Committee orally. He explained the reasons why the Engraver at Calcutta receives a higher salary than the Native Engraver at Bombay, and mentioned that a very large number of Natives are employed as subordinates in the several branches of the Mint. He adhered to his opinion that no Natives have as yet come forward who are competent to undertake the duties of Superintendents, and he expressed his desire to appoint Native Superintendents if he could obtain them. He pointed out that even Railway Companies who employ Natives in their workshops and as Drivers are unable to dispense with European superintendence. He allowed that the Natives make very competent foremen; but was of opinion that the men who could be obtained in India, if they are accurate in their work, are not capable of superintending large bodies of workmen, though he thought that a good Mahomedan with some force of character might do so.

In order to ascertain whether the practice of employing only Europeans or Eurasians as Superintendents obtained in other Government workshops in Bombay and in private yards, the Sub-Committee invited the attendance of Captain Hext, Director of the Indian Marine, and of Mr. Nicol, Engineer Superintendent of the British India Steam Navigation Company's Dockyard.

Captain Hext stated that he had already made considerable reductions in Dockyard expenditure and was anxious to effect further economies; but that he had been unable to do so by substituting Native for European superintendence, because he could find none qualified for that purpose. He explained that Natives had not the opportunity of acquiring the varied experience of Engineers trained in England; that they have not the same energy to undertake works with which they are not familiar; that they are not acquainted with the latest improvements in machinery, and do not pay sufficient attention to economy and the avoidance of waste in dealing with material.

Mr. Nicol, who had been trained as a Marine Engineer in Scotland, agreed in the opinions expressed by Captain Hext as to the defects of Native workmen, and illustrated those defects. At the same time he testified that they are excellent workmen so long as they have not to design or plan work, and that they are especially qualified for fine work requiring delicate touch. Although he allowed that Native workmen are accustomed to work independently on their account, the Natives who sought employment in the yards were, he considered, wanting in self-reliance and resource. He preferred European to Eurasian Engineers as being on the whole more trustworthy as a class. He mentioned that his Assistant is a native of Scotland, that the man who holds the appointment next in rank is a Eurasian; that the Foreman of the Coppersmiths' shop is a European trained in England, and the Foreman of the Boilermakers' shop a European trained in Scotland; that the heads of every department in the Company's yard are of European parentage; and that no Native in the Engineer Department draws a salary from the Company of ₹100.

Assay Department.

In the Assay Department of each of the Mints there are only four appointments carrying salaries of ₹100 and upwards.

The Assay Master receives a salary of ₹1,750 rising to 2,250; the Deputy Assay Master a salary of ₹600 rising to ₹1,200. These appointments are gazetted.

The Head Assistant receives a salary of ₹300 rising to ₹350, and the 2nd Assistant a salary of ₹150 rising to ₹200.

The appointments of Assay Master and Deputy Assay Master are all held by European Commissioned officers, of whom three are members of the Medical Service.

The Head and 2nd Assistants at each Mint are Europeans domiciled in India.

It appears from the correspondence which has been laid before the Sub-Committee that prior to the year 1846, the gazetted officers of the Assay Department of the Indian Mints had, with two exceptions, been drawn from the Indian Medical Service, and that from 1846 the appointments have been uniformly held by members of that service. It was obviously necessary in the circumstances of scientific education in India that the Government should have at hand a certain number of officers with sufficient technical qualifications to fill the places of officers in the Assay Department who might be compelled by sickness or other cause to resign their appointments.

The qualification for appointment was the possession of a certificate from the Secretary of State that the candidate was eligible for employment in the Department, and, to encourage

officers to acquire the necessary scientific and technical attainments, it was the practice on the occasion of a vacancy to offer the appointment to the officer whose certificate was earliest in date.

Prior to 1864, the pay and allowances of officers in the Department were to such an extent superior to those enjoyed in the Medical Department of the Army as to attract Medical officers to the Assay Department, but under the Royal Warrant of 1864 the position and emoluments of officers in the Medical Department were materially improved. About the same time the increase of business at the Bombay Mint induced the Government to increase the salary of the Assay Master at that Mint, and this was effected by a reduction of the salary of the Assay Master at Calcutta, which had been regarded as the prize of the service.

Dr. Shekleton, Assay Master at Calcutta, represented to the Government that the effect of these changes would be to deter Medical officers from qualifying for the Assay Department. In a Despatch No. 185, dated 16th August 1866, the Secretary of State observed that if it became known that appointments in the Assay Department were no longer sought after by Medical officers, it might be anticipated that an increased number of candidates would present themselves from the Military and Uncovenanted Services. On the receipt of this Despatch the Government of India issued a Notification, No. 2823, dated 16th October 1866, announcing that any candidate who could produce the necessary certificate from the Secretary of State would be eligible for employment in the Assay Departments of the Indian Mints. Two gentlemen—Mr. Hynes, of the Account Department of the Bombay Mint, and Mr. Peterson, of the Bullion Department of the Calcutta Mint—in consequence of this Notification qualified themselves and obtained the necessary certificates, and one of them, Mr. Peterson, subsequently held the appointment of Deputy Assay Master in the Calcultta Mint. In 1867 the Government of India departed from the practice of appointing to a vacancy in the Department the officer who held the certificate earliest in date. Dr. Shekleton in a letter, No. 14, dated 7th April 1869, took exception to the terms of the Resolution of October 16th, 1866, as authorizing the appointment of persons other than Commissioned officers, and requiring no other qualification than the production of a certificate of proficiency in assaying the precious metals, which could readily be obtained after a very few months' attendance in a London laboratory. That the Resolution was so understood he inferred from the circumstance that applications had reached him from persons otherwise wholly unfit for service under Government. He contrasted the responsibilities of an Assay Master with those of a mere qualified or commercial assayer in the following terms:—

"As Assay Master of the Calcutta Mint, for instance, I am alone responsible to Government for the standard purity of all coinages, both of gold and silver; I have control over the quantity of alloy; examine the standard meltings, the resulting coins, &c.; have charge of the standard weights and measures of the Presidency; am referred to by the Mint Master on any question in which the integrity of the coinage is involved, and have further the official correspondence of my department to conduct.

"But the weightiest responsibility of all is that in connection with the valuation of imported bullion; the Government on the one hand, and the importer on the other, being bound to abide by my assay, to the value in busy times of as much frequently as £60,000 daily. At the date of my leaving Calcutta in February last, I was issuing Assay Certificates, payable on demand at the Bank of Bengal, for £50,000 each day.

"When I add that these assay operations cannot readily be checked, and that in so far the Assay Master's Office is one of special trust and responsibility, I think I have said enough to prove that Government would be wise in exercising a keener scrutiny in their nominations to this Department than is possible under the provisions of the order alluded to.

"Commercial assayers, *i.e.*, such qualified persons as the Resolution apparently refers to, are only called on to fix the assay value of certain small samples of bullion submitted to them; with this their duty ends, and neither by acquirements or position are they in any way qualified for such an appointment as that of Assay Master of an Indian Mint."

Looking to the efficiency of the Department, he urged that the terms of the Resolution should be so altered or modified that officers of Her Majesty's Civil or Military Services should alone be deemed eligible for employment in it.

In communicating this letter to the Government of India, the Secretary of State adverted to the passage in the Despatch of the 16th August 1866 above referred to, and observed that it might be inferred from the terms of the Resolution of October 1866, that the appointments were to be thrown open to the public generally; but that this had not been intended, and he consequently requested the Government of India to issue a Notification in accordance with the views then expressed. Thereupon the Government of India issued a Notification, No. 1514, dated 22nd June 1869:—

NOTIFICATION.—"The Governor General in Council is prepared to declare that any candidate who can produce the necessary certificate from Her Majesty's Secretary of State for India of his qualifications as an Assayer, and who may be otherwise duly qualified, will be eligible for employment in the Assay Department of the Indian Mints. It is not, however, intended that these appointments shall ordinarily be thrown open to the public generally. Except under special circumstances, when the observance of such rule would, in the opinion of the Governor General in Council, be detrimental to the public service, appointments in the Assay Department will be given to duly qualified officers of Her Majesty's Civil or Military Services."

On the same date the Government of India explained to the Secretary of State that while it agreed with Dr. Shekleton in his estimate of the peculiar responsibilities of the Assay Masters, and would not be disposed as a rule to admit to the Assay Department any person not belonging to one or the other of the Covenanted Services, occasions might arise when a candidate not so qualified might be the best fitted to fill the vacancy, and that it was therefore unwilling to bind itself under no circumstances to employ any one not in its Civil or Military Service. It at the same time suggested that an alteration should be made in the certificates issued by the Secretary of State, so that they should cease to declare persons possessed of assay certificates *ipso facto* eligible for employment in the Assay Department.

From 1869 to 1874 only one officer obtained a certificate of qualification—Captain Robinson, who was subsequently appointed Deputy Assay Master at the Calcutta Mint.

In 1874 Dr. Busteed, the Assay Master at Calcutta, brought to the notice of the Government of India that there was no reserve of qualified Assayers to fall back on if it was deprived of the services of any gazetted officer of the existing staff, and suggested that, as an additional inducement, the pay of the Deputy Assayer should be increased, and special pensions offered to officers who remained for a prescribed number of years in the Department.

The Government of India, in a Despatch, No. 214, dated 2nd June 1874, in view of the circumstance brought to its notice by Dr. Busteed, suggested that, under the orders of the Secretary of State for War, facilities should be given to Engineer officers at Chatham and to Medical officers appointed for service in India to enable them to qualify for appointments in the Assay Department.

The Secretary of State for War expressed his willingness to accept the proposal so far as it affected Engineer officers, but declined to make the same concession in the case of British Medical officers.

The Secretary of State for India, in communicating this reply to the Government of India, expressed the opinion that the dearth of applicants for employment had been mainly, if not solely, caused by the departure from the practice of appointing in the order of seniority of qualification.

It may here be mentioned that, up to 1873, the Assay Masters had received fees for assays of bullion tendered by private individuals and mercantile firms; but that in that year it was decided that the fees should be credited to Government, and that the Assay Masters should receive an addition to their pay of ₹250 a month as a compensation for the loss of them. The pay of the Assay Masters was thus raised to ₹1,750 increasing to ₹2,250.

In October 1874, Surgeon-Major Graham, the Assay Master at Bombay, deprecated the proposal of the Government of India for the employment of officers of the Royal Engineers in the Assay Office and attributed the dearth of qualified candidates to the "introduction of the subordinate element into the ranks of the candidates," and to the uncertainty of the prospects of the officers introduced by the action of the Government respecting fees. As to the employment of subordinates, he admitted that any number might be induced to enter the Department, and, as far as the mere technicalities of the work were concerned, might successfully carry out the operations; but he maintained that as an Assay Master had to arbitrate between the Government and the general public, he should, besides being specially qualified, be an officer of sufficient social status to inspire confidence and not inclined to shirk responsibility,—in short, an officer in one of the Covenanted Services of the Crown. He stated that special officers might doubtless be sent from England thoroughly efficient as Assayers, but that they could have no knowledge of Minting, and that as the mode of assay in India differed altogether from that obtaining in England, they would be useless until they had learned the routine of the process adopted in India. Moreover, he pointed out that, although men brought from England might fill permanent vacancies, this source of supply could not be relied on to fill officiating and temporary appointments. He deprecated the employment of Engineer officers in the Assay Department, so long as Engineer officers were placed at the head of the Mint, as fatal to independence in the two Departments and as likely to inspire distrust in bullion merchants. He expressed his opinion that the most suitable candidates would be found among Medical officers, and urged that they should be attracted by the grant of special pensions.

A correspondence ensued between the Government of India and the Secretary of State, in which the latter expressed his opinion that it was desirable to appoint Medical officers of the establishment in preference to persons not in the service of Government, and eventually sanction was accorded to the increase of the pay of the Deputy Assay Master to a maximum of ₹1,200, and to the appropriation by the Assay Master of any fees received by him for assays made for private persons, less a deduction of 4 per cent. for the use of Government laboratories, chemicals, &c. At the same time the Assay Master was required to assign to the members of the establishment who assisted in the private assays such portion of the fees as he thought fit.

The Government of India, for reasons which it communicated to the Secretary of State in a Despatch, No. 367, dated 12th October 1876, came to the conclusion that it was undesirable to sanction special pensions for service in the Assay Department.

On the 25th May 1876, the Government of India reported to the Secretary of State that it had appointed Surgeon Edis, on probation, to officiate as Deputy Assay Master; but that as he had not obtained a certificate of qualification from the Secretary of State, his appointment

India. Mint. Section I.

had been made conditional on proof of his fitness by passing an examination, and on his undertaking, if so required, to obtain a certificate of qualification from a London Assayer on his first visit to England. It was added that the Government of India proposed to substitute the method of selection then adopted for the practice which had been previously followed.

In a Despatch, No. 312, dated the 10th August 1876, the Secretary of State intimated to the Government of India his disapproval of the procedure adopted in the case of Dr. Edis, and expressed his opinion that the appointment of an officer who had not obtained a certificate of competency to an office of so responsible and technical a nature as that of Assay Master could not be regarded as satisfactory. He added that if at any time there were no qualified candidates available in India, he saw no reason why recourse should not be had to England, and that he would assist in obtaining a properly qualified person.

Meanwhile Dr. Edis had undergone an examination by the Assay Master at Calcutta, of which the result was pronounced satisfactory by both Assay Masters, and was confirmed by the Government as Acting Deputy Assay Master at Calcutta on his undertaking to obtain a certificate of competency on his first visit to England. In acknowledging the Despatch of the 10th August and apprizing the Secretary of State of its action with respect to Dr. Edis, the Government of India observed: "We think it of great importance, first, that our Assay Masters and Deputy Assay Masters should be Commissioned officers in Her Majesty's Service, and, secondly, that our discretion should, as far as possible, be unfettered in the selection for any vacancy of an officer whose previous tastes and acquirements, as well as his particular standing in the service, mark him out as promising to be especially qualified for the office." It was pointed out that if an Assayer's certificate were to be a *sine quâ non* for admission to the Department, the Government might be compelled to appoint to a vacancy an officer of less promise than others whom it might prefer to select. It was suggested that the best course to avoid this difficulty was to select candidates and appoint them on probation, subject to a thorough local test of their qualifications after experience in the Indian Assay offices in the first instance, and then to their obtaining the usual certificate of qualification from the Secretary of State on their first visit to England. It was added that preliminary selections might be made upon a competitive examination if a sufficient number of suitable candidates should be found; but that the Government would reserve the right of nominating the officers to be admitted to such competition after a consideration of their antecedent qualifications. The Government of India also pointed out that, under the arrangement suggested by the Secretary of State, it would have no voice in the selection of the candidate, and that he would not necessarily be a Commissioned officer, and moreover that it appeared inexpedient to send from England an officer to fill a temporary vacancy. It, therefore, pressed the Secretary of State to approve of the proposals it had made; but suggested that, if His Lordship continued of a contrary opinion, he might perhaps consent to the appointment, as occasion arose, of one or two officers as probationers to the Assay offices for a period of three or four months each in anticipation of the occurrence of any actual vacancy in the office of Deputy Assay Master; and expressed its willingness to make the possession of a local certificate of qualification after examination by the Assay Master a condition precedent for an appointment of Deputy Assay Master. If, however, its proposals did not commend themselves to His Lordship, the Government of India requested that it might be allowed to depute selected officers from time to time to England at the public expense to obtain the needful qualifications there; but it deprecated that alternative as involving unnecessary expense and as committing it to the deputed officers more than it thought convenient.

In a Despatch, No. 40, dated 8th February 1877, the Secretary of State insisted that before any officer was permanently appointed to the Assay Department he should have received a certificate of qualification from the Royal School of Mines or some kindred institution, to be approved by him for that purpose, and that no officer should be retained in the Department without such a certificate in a temporary capacity for a longer period than twelve months, unless circumstances should render it quite unavoidable.

Further correspondence ensued, and opinions were obtained by the Secretary of State from the Science and Art Department at Kensington, Professor W. Chandler Roberts, and Professor E. Frankland, and eventually, with the sanction of the Secretary of State, the Government of India issued a Notification, No. 3570, dated 19th September 1884, which at present regulates admission to the gazetted appointments in this branch of the Mint.

The Resolution is as follows:—

I.—As directed in Resolution No. 124, dated 12th May 1876, Commissioned officers only shall, as a general rule, be appointed substantively to the Assay Department.

II.—No officer shall be appointed substantively to the Assay Department without producing the following four certificates after practical examination:—

(1) Of attendance at a three-months' practical course of Inorganic Chemistry (qualitative only) at the Normal School of Science, London.

(2) Of attendance at a three-months' practical course of Metallurgy at the Royal School of Mines, especially with reference to the assaying of gold and silver and their alloys.

(3) Of attendance for a month at the Assay Laboratory of the Royal Mint, London, permission to attend the Mint being previously obtained from Her Majesty's Secretary of State for India.

The above courses not to be taken out simultaneously, but to occupy seven months in all.

(4) A certificate from the Head Assayer of the Royal Mint as to the candidate's ability to assay the precious metals to be tested by practical examination.

III.—The certificates, when obtained, should be forwarded by the officer to Her Majesty's Secretary of State for India, who will then inform the Government of India whether the officer is *pro tanto* qualified for the Assay Department, subject to completion of his qualification by attendance at the Assay Office Laboratory at Calcutta or Bombay for a certain probationary period.

IV.—Whenever a want of candidates eligible for admission to the Assay Department is foreseen, the Government may permit a selected officer to attend at the Laboratory of the Assay Master at Bombay or Calcutta for a period not exceeding six months in order to prepare himself for a prescribed examination. During this period of probation, the full salary of the office he may happen to hold at the time, subject to a minimum of R450 a month, and in addition the Presidency house-rent of his rank, will be granted to him. At the expiry of the term of probation, the probationer will be examined by the Assay Master of the Mint to which he is attached, the examination being framed so as to test the practical familiarity of the probationer with the ordinary work of an Indian Assay Laboratory, and with the duties expected of an Assay officer attached to a Mint, and his knowledge generally of the methods of assaying both gold and silver, and particularly of the method of assaying silver which is peculiar to the Indian Mints. Certain alloys should be given to the probationer, and a report on their fineness required according to such methods of assay as may be stipulated at the discretion of the Assay Master; and it must be a condition that the whole of the manipulating details shall be conducted by the probationer with his own hands. The ability of the probationer to prepare pure gold and silver for assay check purposes should also be carefully ascertained. An officer who has so passed the prescribed local examination only may, at the discretion of the Government of India, be employed temporarily in the Assay Department. The period of such employment, however, is not to exceed twelve months at one time, unless under very special circumstances, and with the sanction of the Secretary of State.

V.—The Governor General in Council desires it to be understood that the mere successful result of the examination thus prescribed, or of any other, will not entitle the probationer to appointment to the Assay Department. The Assay Master under whom he is employed should report confidentially to Government his opinion as to the aptitude and general (apart from mere technical) fitness of the probationer for the position of an Assay officer. A similar report will be required also in the case of officers who have obtained the certificates referred to in clauses II and III.

The Head and Second Assistants are appointed by the Assay Master, and the Second Assistant would ordinarily be promoted to the position of Head Assistant on the occasion of a vacancy.

The Assay Master and Deputy Assay Master obtain leave under the furlough rules applicable to Military officers in civil employ, and are entitled to pensions under the rules applicable to the service to which they belong. The provisions of the Civil Leave and Pension Codes applicable to the Uncovenanted Service regulate the furlough and pensions of the non-gazetted officers.

The qualifications for an Assay Master are to be inferred from the nature of the tests which the Government of India has imposed as qualifications for the appointment, and may be gathered from the Departmental note prepared by Major Martin, the Assay Master at Bombay.

The Assay Master being responsible for the accurate assaying and valuing of precious metals brought for coinage, checks all the metallurgical steps in that process with regard to fineness, and finally passes the coin.

Departments of the Government, such as the Gun Carriage, the Arsenal, and the Small Arms Factories, apply to him when they require an analysis of metals connected with their work. Mining engineers and explorers send to him specimens of ore for assay, and banks and merchants frequently seek his assistance to determine the value of metal, or refer to him for decision disputes arising in dealings in metal.

In view of the magnitude of the interests with which the Assay Masters have to deal, they must not only possess such scientific attainments and such technical knowledge as may enable them to arrive at accurate conclusions respecting the constituents of metallic substances and to check the operations of their subordinates, but they must also inspire confidence in their judgment and independence.

Although a less degree of scientific knowledge is required of the Head and Second Assistants, they must possess a sufficiency of such knowledge to apprehend intelligently the technical processes in which they are employed, must exhibit the utmost care and method in the carrying out of such processes, and must be absolutely trustworthy.

In his Departmental note, Major Martin expresses a doubt whether Natives could be found sufficiently qualified to discharge the duties which devolve on Assay Masters and their Assistants, and whether, as a class, the Natives among whom education has principally spread would possess sufficient moral courage to resist the temptations to which they are peculiarly exposed in responsible offices in the Assay Department. Moreover, he thinks, seeing that the responsibility practically vests in the Assay Master, that that officer ought to be allowed free liberty to select as his subordinates the class of men in whom he feels the greatest confidence.

Surgeon-Major Scully, the Assay Master at Calcutta, stated that he had no objection to the employment of Natives, Eurasians and domiciled Europeans in any posts in the Assay Department, provided they were qualified and of proved honesty.

Mr. Couldrey, Head Assistant in the Assay Department, tendered himself for examination at the sittings in Bombay. He stated that, as the result of an examination in which he had competed with about fifty other candidates, he had, at the age of 14 years, obtained an appointment in the Assay Department on a salary of ₹50; that he had received his technical education in the Department, and after holding for some years the appointment of Second Assistant, had been promoted to the post of Head Assistant, which he had held for fourteen years, and in which he had now attained the maximum pay of ₹350. He mentioned that in addition to his salary he occasionally received some small sums for overtime work, and was allowed by the Assay Master about ₹100 a month out of the fees for private assays.

Mr. Couldrey desired on behalf of the Uncovenanted Assistants in the Assay Department to point out the hardship entailed on them by the terms of the Notification which, except in exceptional cases, declared that none but Commissioned officers were eligible for appointment to the gazetted offices. He contended that Assistants who had served for years in the Department had from the very nature of their employment, as was shown by the note of the Assay Master, proved themselves trustworthy and possessed of sufficient chemical and metallurgical knowledge. He complained that such men after many years of faithful service should be discouraged by being superseded by officers who might be their juniors in age and devoid of their experience. He maintained that the system of introducing officers on probation with a view to their appointment to the higher grades entailed great expense—expense which was unnecessary in any case when there were in the Department Assistants qualified to fill the appointments of Assay Masters, and often thrown away either because the probationer declined or was found unfit to hold an appointment in the Department. He expressed his doubts whether the training vouched for by the certificates required as a qualification for appointment to the higher grades is in reality sufficient to secure thoroughly competent Assayers, and in support of this opinion he alluded to an instance which he said had come within his own knowledge. He referred to the practice which prevailed in other Departments of promoting men of exceptional merit to the gazetted ranks as warranting the claim he made on behalf of himself and his fellows, and he pointed out that the very nature of the duties they were called upon to discharge was so special, that they could not hope to find an opening in other Departments or in professional life. He also complained that the salaries compare unfavourably with those enjoyed by the higher officers in other Departments and even in the Mint proper. In the course of his observations he asserted that the probationers actually came under instruction by the Assistants.

Mr. Couldrey added that on the occasion of his taking leave to Europe, he should have secured the qualifications necessary if he had not been deterred from doing so by the terms of the Government Notification.

As to the employment of Natives in the Department, he doubted whether those who could sufficiently master Chemistry would be willing to undertake the practical work of Metallurgy, and he mentioned that one Native who had been employed in the Department had not proved a success; but he would not say that a Native who had passed through the same grades and had enjoyed the same opportunity of learning the work as he had had, would not become equally qualified to be an Assayer.

In a further Departmental note, Major Martin combats the grounds on which Mr. Couldrey advocated the opening of the higher grades to the Assistants. He considers that the Assistants do not possess the same scientific or general education as the officers who have hitherto been gazetted to the superior appointments. He maintains that the training the probationers received from the Assistants is confined to the exposition of the processes used in the Department and such assistance as would be rendered by them to the Assay Master himself. He points out that the examination prescribed for probationers, both practical and theoretical, is arranged and entirely carried out by the Assay Master, and that a confidential report is sent in by the Assay Master as to their general fitness for employment in the Department apart from mere technical fitness. He expresses doubt of the correctness of Mr. Couldrey's estimate of the qualifications of a probationer to whom he (Mr. Couldrey) had alluded, and of his estimate of the expense entailed on Government by the system of training probationers. He also points out that the officers at present in the Department are all senior men in reference to whom Mr. Couldrey's complaint of supersession on the score of age is unfounded. He admits that the Assistants under him are far better educated than men in their station of life generally are; he considers that Mr. Couldrey's complaint as to the insufficiency of their pay is well founded; and he repeats the arguments which he had previously used to support the Resolution of Government limiting the appointments to Commissioned officers, and maintains that it is essential that this restriction should be preserved in order to give the public full confidence in the independence of the Assayer.

INDIA.
Mint.

Section II.—Notes by Departmental Members.

From Lieutenant-Colonel R. S. RIDDELL, R.E., Master of the Mint, to the President, Sub-Committee, Public Service Commission, Bombay, dated 13th July 1887, No. 836.

In compliance with the request made in your letter No. 383-S, dated 5th July 1887, I have the honor to enclose, herewith, a statement showing the existing organization and constitution of the Calcutta Mint.

Existing organization and constitution of the Mint Department, Calcutta.

1	2	3	4						
			Number of appointments in each class or grade now held by—						
Department.	Total number of gazetted appointments or of appointments not being purely clerical of salaries of Rs. 100 and upwards.	Distribution of the gazetted appointments and the other appointments mentioned in column 2 amongst classes and grades, with rate of pay attached to each.	1 Europeans not domiciled in India.	2 Europeans domiciled in India.	3 Eurasians.	4 Natives of India. (a) Hindus.	(b) Mahomedans.	(c) Others.	(d) Total.
Mint	1 Gazetted ..	Master of the Mint, Rs. 3000.	1	..	..	..	..	..	..
	22 Not gazetted ..	Head Mechanical Engineer, Rs. 500 to 600.	1	..	..	..	..	..	..
		2 Engineers, 1st Grade Rs. 300 to 400.	2	..	..	..	..	..	..
		2 Engineers, 2nd Grade, Rs. 250 to 300.	2	..	..	..	..	..	..
		2 Engineers, 3rd Grade, Rs. 200 to 250.	1	1	..	..	..	..	..
		1st Grade Apprentice, Rs. 100 to 150.	..	..	1	..	..	..	..
		Melter, 1st Grade, Rs. 450.	..	..	1	..	..	..	..
		Melter, 2nd Grade, Rs. 300.	..	..	1	..	..	..	..
		Melter, 3rd Grade, Rs. 200.	..	..	1	..	..	..	..
		Melter, 4th Grade, Rs. 100.	..	..	1	..	..	..	..
		1st Assistant to Mint Master, Rs. 450 to 600.	1	..	..	..	..	..	..
		2nd Assistant to Mint Master, Rs. 450.	..	..	1	..	..	..	..
		3rd Assistant to Mint Master, Rs. 300.	..	..	1	..	..	..	..
		4th Assistant to Mint Master, Rs. 150.	..	..	1	..	..	..	..
		Bullion-Keeper, Rs. 500.	..	..	..	1	..	..	1
		Deputy Bullion-Keeper Rs. 200.	..	..	..	1	..	..	1
		Bullion Superintendent, Rs. 100.	..	..	..	1	..	..	1
		Engraver, Rs. 500 to 600.	1	..	..	..	..	..	..
		Assistant Engraver, Rs. 100.	..	..	..	1	..	..	1
		Warder Rs. 200 ..	1	..	..	..	..	..	..
		Total ..	10	1	8	4	..	..	4

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From Surgeon-Major J. SCULLY, Assay Master, to the President, Sub-Committee, Public Service Commission, dated Calcutta, 11th July 1887, No. 42.

I have the honor to return the form sent with your letter No. 384-S, dated 5th instant, duly filled up and giving the information you ask for.

Existing organization and constitution of the Assay Department, Calcutta.

1	2	3	4						
			Number of appointments in each class or grade now held by—						
			1	2	3	4 Natives of India.			
Department.	Total number of gazetted appointments or of appointments not being purely clerical of salaries of Rs. 100 and upwards.	Distribution of the gazetted appointments and the other appointments mentioned in column 2 amongst classes and grades, with rate of pay attached to each.	Europeans not domiciled in India.	Europeans domiciled in India.	Eurasians.	(a) Hindus.	(b) Mahomedans.	(c) Others.	(d) Total.
Assay Department.	4 (2 gazetted and 2 not gazetted).	1 Assay Master, Rs. 1,750 to 2,250.	1	..	..	..	..	..	..
		1 Deputy Assay Master, Rs. 600 to 1,200.	1	..	..	..	..	..	..
		1 Head Assistant, Rs. 300 to 350.	..	1	..	..	..	..	..
		1 Second Assistant, Rs. 150 to 200.	..	1	..	..	..	..	..

Note by Major-General J. H. WHITE, R.E., *Mint Master, Departmental Member, Bombay.*

Existing organization and constitution of the Mint Department, Bombay.

HEAD I.

All Europeans and Natives serving in the Mint are appointed by the Mint Master. Promotion generally goes by seniority unless a man has shown himself unfit for it.

Lower appointments, Bullion department.—As regards the lower appointments in the Mint excluding of course all mechanics and laborers, it is found that a high standard of educational qualification is not necessary; what is wanted is a steady, plodding man of good character, of no very high aspirations; but contented to remain on in the department he is appointed to; the sphere is small and the pay is not large; if men of ability and education were appointed to such posts, the Mint Establishment would be subject to constant changes which would be most objectionable.

The Assistants in the Bullion departments generally rise in their own departments, but men are shifted from the Office to the Bullion and the Bullion to the Office department whenever it may be considered advisable.

Bullion-Keepers.—The mechanical Bullion-Keeper would, as a rule, be appointed from the Assistants in the department; it requires long experience to fill this office well; and the man who holds it must be very sharp and energetic. No outsider could do the work well; it is too intricate. The Bullion-Keeper who is in charge of the bullion received from Bankers and Merchants is on the other hand generally an outsider, as it is seldom the case that any of the Assistants in the Department can furnish the required security of Rs. 25,000; the duties of the post are simple and are well acquired after a training of one or two years.

Whenever a vacancy occurs, advertisements are issued and the most suitable candidate is selected; the field of selection is, however, very small on account of the large security; the post is usually held by a Parsee.

Office Assistant to Mint Master.—The Assistant to the Mint Master generally rises in the office, but if the accountant who is next below him is not of long service the Mint Master appoints from outside. A case of this kind has just occurred, the acting appointment having been held by an officer in the Public Works Accounts branch.

Accountant.—The Accountant also generally rises in the office from the position of first-class clerk; this latter appointment was, however, given by General Ballard to a Native on account of his long and good service, the man next below him having only served a comparatively short time in the Mint.

The posts of Assistant Accountant and First-class Clerk has been, as far as I am aware, nearly always held by Europeans or Eurasians.

Mechanical Department.

The Foreman always rises in the Mint and is appointed from among the Superintendents.

The Superintendents generally rise in the Mint, but sometimes are appointed from outside; two such have been appointed within the last seven years. It is absolutely necessary that there should be a good proportion of European trained Engineers; men with force of character and a high sense of duty. Men trained in this country, as a rule, labor under great disadvantages; in the first place the climate is against them and saps their energies; and in the second place they lack the experience of the English trained workman; they do not know what hard and accurate work is. Of the two outside Engineers who were appointed, one had served in the Indian Navy and afterwards was Engineer in a Cotton Press; the other was in the P. and O. Service. Three of the Engineers now in the Mint have risen from the position of apprentice.

Head II.

The permanent establishments serve under the conditions of the Uncovenanted Service pension and leave rules. As regards the pension rules, I must remark that it is scarcely to be expected that a European serving in the Melting or Mechanical departments of the Mint can qualify for his retiring pension; only one European Engineer has I believe ever done it. Superintendence of mechanical work in a most relaxing climate and in very hot rooms is more than most can stand for such a period as 30 years; I think therefore that a Mint Engineer should be allowed to claim a retiring pension after 25 years' service and an invalid pension after 22 years.

Head III.

The Engineers in the Mint are the only persons who require any technical knowledge; they ought all to be good mechanics.

We find it a great advantage having a Superintendent of the Premelting department who has a knowledge of moulding.

All the above posts are held by Europeans and Eurasians. Natives might be appointed were they men of character, good mechanical training and suitable for the work, but no such men have yet come forward. Of the ten Mechanical Engineers, two have been sent out by Secretary of State, five appointed by Mint Master from outside, three have risen from apprentices.

Head IV.

Hindus, Parsis and a few Mussulmans seek to be employed in the Office and Bullion departments; Europeans and Eurasians only in the Mechanical Departments; I do not speak of laborers.

In Bombay the Parsi generally makes the best Bullion-Keeper. During my term of office I have had three *Bullion*-Keepers, two Parsis and one Hindu. The Hindu Bullion-Keeper *here* does not I think like undertaking the responsibility of a large charge; the Parsi sets to his work more calmly and steadily than the Hindu, is perhaps less cliquey and has greater energy. We had, however, a Hindu *Mechanical* Bullion-Keeper a few years ago in this Mint who was a man of great force of character and extraordinary energy; but, as I have since heard, oppressive in his conduct at times to those under him.

Our present Mechanical Bullion-Keeper is a Mahomedan, and a very suitable man for the post; I should like to see more Mahomedans in the Mint; they are generally reliable and energetic, and make themselves obeyed and respected by those under them; but unfortunately we have few applicants of this class.

In the Mechanical Department Europeans and Eurasians only are applicants for the post of Engineer. No Natives have yet applied. I consider the Engineer trained at home generally very superior to one educated out here; the work in England is so hard, the opportunities for a mechanic obtaining a wide knowledge of his trade so large, work is conducted in the shops in such an orderly systematic manner, that an Engineer trained under these circumstances must, as a rule, turn out a better all round man than one who is brought up in Bombay and whose whole experience lies perhaps in a single workshop. There will always be exceptions to this rule, but I think it will be in the interests of Government to retain certainly one half of the Engineering appointments for European trained Engineers. In time Natives, probably Parsis, will come forward, but these will I have no doubt have had the advantage of a certain amount of training in European workshops, as they are an energetic class of men with a fair amount of mechanical aptitude and ready to put themselves out to obtain the best experience.

Throughout the Mint the different classes are mixed. In the Office and especially in the Bullion Departments all classes are represented, the Mussulmans being in a minority; the mixing of the different classes has always to be kept in view in filling up vacancies.

I may add that as far as my experience goes the present regulations of the department work well.

HEAD V.

The return asked for is submitted.

1	2	3	4						
			NUMBER OF APPOINTMENTS IN EACH CLASS OR GRADE NOW HELD BY—						
Department.	Total number of gazetted appointments or of appointments not being purely clerical of salaries of Rs. 100 and upwards.	Distribution of the gazetted appointments and the other appointments mentioned in column 2 amongst classes and grades, with rate of pay attached to each.	1 Europeans not domiciled in India.	2 Europeans domiciled in India.	3 Eurasians.	4 Natives of India. (a) Hindus.	(b) Mahomedans.	(c) Others.	(d) Total.
	1 Gazetted ..	Master of the Mint, Rs. 3,000.	1	..	..	..	..	..	..
		* Foreman Rs. 500—700 ..	1	..	..	..	..	..	..
		* Superintendent, Rolling Department, Rs. 350—450.	..	..	1	..	..	..	..
		Assistant Superintendent, Rolling Department, Rs. 140—200.	1	..	..	..	..	..	..
		* Two Superintendents of Coining Department, Rs. 380—450.	2	..	..	..	..	..	..
		Assistant Superintendent of Coining Department, Rs. 80—120.	..	1	..	..	..	..	..
		* Superintendent, Engine Department, Rs. 250—350.	..	..	1	..	..	..	..
		* Superintendent, General Workshop, Rs. 250—350.	..	1	..	..	..	..	..
		* Superintendent, Adjusting Department, Rs. 250—350.	1	..	..	..	..	..	..
		* Superintendent, Weighing Department, Rs. 250—350.	1	..	..	..	..	..	..
		Melter, Rs. 450—500 ..	..	..	1	..	..	..	..
		* Assistant Melter, Rs. 250—350.	1	..	..	..	..	..	..
		Second Assistant Melter, Rs. 140—200.	..	1	..	..	..	..	..
		Assistant to Mint Master, Rs. 600—800.	..	1	..	..	..	..	..
		Bullion-Keeper, Rs. 250 ..	..	..	..	..	..	1	1
		Bullion-Keeper, Mechanical Department, Rs. 300.	..	..	..	..	1	..	1
		Deputy Bullion-Keeper, Mechanical Department, Rs. 160.	..	..	..	1	..	..	1
		Engravers, Rs. 90-P.A.—60.	..	..	..	1	..	..	1
		Warder, Rs. 150	..	1	..	..	..	..	..
		Total ..	8	5	3	2	1	1	4

* These officers receive in addition to their salaries a monthly allowance of Rs. 60 each on account of house rent.

Note by Major GERALD MARTIN, F.R.G.S., F.C.S., *Assay Master, Bombay.*

Existing organization and constitution of the Assay Department.

The department is a small one; there is an Assay Master, a Deputy Assay Master, two Assistants, a Clerk, Weighmen, Furnace men, Stillmen and Laboratory hands, &c., as shown in the accompanying statement.

The Assay Master and Deputy Assay Master are Commissioned Officers as laid down with the sanction of the Secretary of State in Resolution of the Government of India, Financial Department, No. 124, of the 12th May 1876.

An Officer can only be gazetted to the department, provided there is a vacancy, after having obtained the certificates of qualification laid down with the approval of the Secretary of State in Resolution of the Government of India in the Financial Department, No. 3570, dated September 19th, 1884—

A certificate of qualification in Inorganic Chemistry and Analysis from the Normal School of Science, London.

A certificate in Metallurgy and Assaying from the Royal School of Mines, London.

A certificate from the Chemist and Assay Master of the Royal Mint, London, as to his having put in a period in his Laboratory, and fitness to conduct the duties of such an office.

Having obtained these certificates the candidate sends his name and certificates to the Secretary of State who informs the Government of India, and the Officer's name is noted as that of one who has obtained the necessary certificates in England.

The candidate has, however, yet to attend one of the Indian Assay Offices, either Calcutta or Bombay, for a probationary period of six months, at the expiry of which he is examined and reported on confidentially by the Assay Master as to his aptitude and general fitness, apart from mere technical fitness, for the position of an Assay Officer.

Having completed this course, he is considered a qualified officer, and can then be employed by the Government should a vacancy occur ; but the Government at the same time does not bind itself to appoint officers in the order in which they may have passed, but will choose the one who is considered " all round " to be the best suited for the appointment.

Promotion from Deputy to Assay Master is gazetted by the Government of India. As before stated, at each office in Calcutta and Bombay there is an Assay Master and a Deputy, thus there are in India four Commissioned Officers, and promotion takes place (unless the Government has any special reason for the contrary) according to seniority, that is to say, on the post of Assay Master becoming vacant at either Office the Senior Deputy is promoted to be Assay Master without reference to the office at which he may be when the vacancy occurs.

There are no other gazetted Officers in the department than those dealt with above.

European Assistants.—The two Assistants are Europeans of the Uncovenanted Service and are not gazetted Officers, but are appointed by the Assay Master. There being only two appointments a vacancy rarely occurs ; for example, my Senior Assistant is in his 27th year of service, and my Second Assistant has completed 16 years' service.

The Assay Master on first appointing men to such positions has to be guided by the qualifications necessary for such posts—posts, as I show further on, of very considerable responsibility, and requiring peculiar technical and special knowledge in the holders. The men must be of high character so that they can be implicitly trusted, and they, from the nature of the work, require to have had a sound education, and to possess certain scientific knowledge including a knowledge of Chemistry and Metallurgy, and be men who will not be satisfied with the mere fact of having obtained an appointment, and thus carry on the daily routine portion of it regularly without further interest, but who will be anxious to advance in scientific knowledge, and take a keen intellectual interest in the various scientific metallurgical questions that arise at different times.

The promotion from Junior to Senior Assistant is made by the Assay Master if he considers the person fit to be promoted and this would naturally be the case, as from what I have already said it is evident that a man remains a long time as Second Assistant before he can possibly be promoted and has probably acted several times in the position of First Assistant, and thus he is naturally better acquainted with the work than any other man would be ; while, was he not competent, he would have been dismissed while Second Assistant.

The pay of the Assay Master is Rs. 1,750 a month rising by annual increments to Rs. 2,250 a month as laid down with the sanction of the Secretary of State in Resolution of the Government of India in the Financial Department, No. 124, dated 12th May 1876, and in the Secretary of State's Despatch, No. 321, dated 23rd September 1880.

The pay of the Deputy Assay Master is as follows :—

Standing on First Appointment.	Minimum.	Yearly Increment.	Maximum.
	Rs.	Rs.	Rs.
Under six years	600		
Six years	650	100	...
Seven years	750		
And so on, Rs. 100 being added for each additional year's standing on first appointment up to the maximum	...	...	1,200

The pensions are those given to officers by the Military Pension Rules under which they may be serving, *i.e.*, if an Indian Medical Officer under those rules, if an Engineer officer under the rules for the corps, if a Staff Corps officer under the rules for that Corps. Furlough is taken also under the Furlough Rules for Officers in Civil employ according to which rules the said officer may be under.

* * * *

European Assistants.—The two European Assistants are paid as follows :—

Senior Assistant, Rs. 300 rising by yearly increments of Rs. 10 to Rs. 350 per month.
Junior Assistant, Rs. 150 rising by yearly increments of Rs. 10 to Rs. 200 per month.

I would, however, remark that the pay of the Senior Assistant was only altered four years ago. Previously it was Rs. 300, but the Government, on the strong representation of the Assay Master, allowed it to increase by yearly increments to Rs. 350, because the Senior Assistant in Calcutta was drawing that amount; thus my Senior Assistant, although in his 27th year of service in this office,

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has just obtained Rs. 350 a month. I shall have more to say on this point later on. At present I simply state the facts.

The two Assistants being Uncovenanted, and not Gazetted Officers, come under the Uncovenanted Officers' General Pension and Furlough Rules.

The whole of the Uncovenanted Establishment are allowed extra pay for extra work. This is not (as in the Mint and other departments) regulated by the number of hours the men are employed, as work of such a nature as ours cannot be thus measured, and my men have to be often kept in late when there is no extra large amount of work to be done, simply because chemical and metallurgical operations cannot be hurried and may yet have to be finished by a certain time, and to pay them by hours would be absurd and a loss to Government. We therefore have a fixed amount of work laid down by the Government as a fair day's work; when that amount is exceeded the Uncovenanted portion of the establishment may, on the Assay Master certifying that in his opinion it has been properly earned, receive extra allowances at the rate of half a day's pay for any such day or days.

In the Mint and such like mechanical works extra work can also be got through by employing more hands, but of course in a laboratory like ours this is impossible, as we can only employ our own carefully trained men, and they must keep at it in order that work may be completed up to time.

The qualifications required by Government for the appointment of the Commissioned Officers to the post of Deputy Assay Master I have already quoted at the commencement of my letter, and they are all absolutely necessary both to show that the officer has the requisite chemical and metallurgical knowledge for the position, has had a certain amount of experience in the particular and peculiar work of such a laboratory before he is appointed, and also that he is in character and socially a gentleman whom the Government can safely put in such a position. To see the real importance of this one must somewhat understand what the duty and responsibility of the Assay Master are.

The Assay Master is the Head of a department under the Government of India that has for its duties the assaying of precious metals, metals generally, and ores, &c.

The Assay Master is in fact the Assayer and Metallurgical Adviser to the Government; he has, as Chemist and Assay Master of the Mint, the assaying and valuing of all precious metals brought for coinage, and he checks all the metallurgical steps in that process with regard to fineness, and passes the final coin; he is the metallurgical adviser to the Mint Master (who is the Mint Engineer), and in such matters is the guardian of the Government interest on the one hand and the public on the other; from his position he is also the referee in many very important questions between Banks and Firms, and is the person to whom various Government departments, such as the Gun Carriage, Arsenal, Small Arms, &c., at times apply when they require analyses made of metals connected with their work, even to the assaying of gold lace for the Clothing Department. Mining engineers and explorers also refer to him and send specimens of ore for assay.

Thus it is evident that not only are questions of scientific interest referred to him, but that many important matters dealing with considerable sums of money, or large contracts, may depend on his decision.

It is therefore absolutely necessary that in all ways he should be a thoroughly qualified official, and also one whose character and antecedents place him above suspicion, and who is in a position to be able to act and advise absolutely without bias.

Now turn to the two Assistants. It must be evident from what I have shown above to be the nature of the work carried on by the department, how very important the work is that the Assistants have to perform, and what great responsibility is attached to their posts. The carrying out of the various processes required by the Assay Master in the laboratory falls to their hands and requires special scientific knowledge and training; questions requiring the utmost care, forethought, and delicacy of treatment depend on them: a mistake might be of great moment not only to the Assay Master but to the Government or public.

Again receiving as they do the various precious articles and specimens brought for assay, being as they are in a position of trust in matters in which the interests of the very men who present these things are seriously involved, a position in which with the knowledge possessed they would be able very seriously to affect results, I say considering all this it is evident that should one of the Assistants be anything but a perfectly upright, straightforward man and above temptation, the consequences would be very serious. It is therefore most important that the Assistants should be men who have had a sound education, who possess special chemical and metallurgical knowledge, and who enjoy such a character that an Assay Master can fearlessly, confidently, and implicity trust them.

As to what classes of the community seek to be employed, and the comparative capacity of each for rendering efficient service therein. With regard to the Assay Masters they have to be Commissioned Officers, and more need not be said on that matter at present, though I refer to it again hereafter.

The Assistants are domiciled Europeans, and as there are only two, and vacancies cannot often occur, it would be difficult to say what men might apply, but as I have shown already it is absolutely necessary that the holders of these posts should be men of sound principles and education. The Assistants we have work excellently, and I see no reason for any alteration in the present procedure,

except what I refer to further on. The post is one in which the holder must have strength of character and a strict sense of duty. I am perfectly certain that it would be most unwise to put a Native into such a place even if he had acquired the knowledge, as I know he could not be trusted to carry on the ordinary work, and still less any portion of experiments, thus the Assay Master would have to do infinitely more work than he could possibly get through, and finally the temptations of the position are those which would be most peculiarly trying to the Native character, and it would not be fair on any Assay Master to put Natives in such a position. In giving my views further on I have said more on this subject.

My First Assistant was as a boy first educated in the Byculla School, Bombay, and was then chosen from among 50 other candidates of mature age, after an examination held by the Assay Master, when he was 14½ years old; he has been in this laboratory ever since, and has gained his scientific knowledge here and during visits to England.

My Second Assistant was educated partly at the Scottish Orphanage and partly privately. He was first appointed to the Public Works Department, and left it to enter the Assay Department. He studied chemistry and attended chemical lectures given by Dr. Young. He has also gone through a course of assaying at the Royal School of Mines, London. I have to enter these men as domiciled Europeans as they come under the Government definition, and spent their boyhood, and were educated in this country.

Thus far I have confined myself to only answering the questions asked in your paragraph 1 as briefly as possible, but in giving my personal opinion as requested in your paragraph 2, I shall have also to explain somewhat the nature of the responsibility and work of the Assay Department. I know it is not generally understood, and it has an important bearing on the question under consideration. I would, however, premise what I have to say by remarking that I am not a person who is in any way prejudiced in the question of the employment of Natives. During twenty years' service in India, I have, besides the Presidency towns, served in the Punjab, North-West Provinces, Bengal, Assam and Deccan, among the hill tribes on the North-East Frontier and North-West Frontier and Afghanistan and on the Western Ghauts, and from the very nature of my former work in the Survey of India, together with my assay work in later years, I have been brought in contact with Natives of every race, caste, and creed from the highest to the lowest, from the most educated to the naked savage, and have lived among them under such various conditions as does not often fall to the lot of Europeans in this country. I have therefore many friends among them and I have very decided opinions on the relative worth of different races and castes in different posts, and I know how excellently they can perform work whether administrative, political, mercantile, military, &c., as long as the nature of the duty and the character of the responsibility suits them; but I also know how they fail directly they are placed in positions which call for characteristics they do not possess.

I do not however wish to be misunderstood. I do not say that I think them even when they are a success as good as Europeans. On the contrary I feel sure that were everything open to practical competition, and were the highest positions given only on merit, every one of them would be held by a European; for although several Natives might pass in examinations for various departments of the state higher than Europeans, yet in afterlife, whether it be in an administrative capacity, in military leadership, in technical knowledge, in commerce, or in scientific superintendence of manual labor, or in any other path of life, the moment real difficulties presented themselves it would be to the European and not to the Native that not only the Government but also the individual would turn for advice, action, and practical assistance; and I am certain that this feeling of confidence in the Englishman exists among the Natives themselves, from the man in a high Government post down to the ryot, from the owner of a factory to the mill-hand.

There is an inclination apparent among some in power and professed philanthropists and dreamers to close certain paths of life in India to the European and open them to the Native, and this I think is unwise and even dangerous; unwise because it is keeping out the better material for the poorer, and dangerous because when the strain comes the weaker material will break. Thus were the market really free I hold that the European would on his own merit leave the Native far behind, and his doing so would be an infinite advantage to the country. There are high positions, however, to which Natives are peculiarly suited, and I can see no reason for their not being employed in them. I am however forced to say that my experience has led me to the opinion that the finest Native characters are as a rule not met with in the Presidency towns; the peculiar principles and ideas of Asiatic honor which any Englishman can appreciate and admire, and which he meets with elsewhere in India, do not seem to flourish in these cities, and one fails to find and worthy substitute for them. It is true that the people may have more superficial book knowledge which causes them to style themselves educated men, and they may talk and write more or less English; but they are not as a rule men with such good antecedents, and have I consider far less honor and courage (both physical and moral) than their better born though less educated brethren in the country.

Unfortunately our education does not generally seem to reach the right stamp of Native, which may be, and undoubtedly is, largely their own fault, though that is a matter apart from the present subject, and I need not enter on it; but it leads me to two important points as regards the Assay Department; first to the consideration as to what is likely to be the moral strength of character of the only Natives who would probably be able to pass the examinations required for admittance into the Department, and secondly as to the tone which distinguishes a large portion of the mercantile

community with whom the former would have to deal. I should not be doing my duty as Head of this Department did I not distinctly state that I believe the former would be unable to resist the temptations which would beset them—temptations which would be especially trying to them as Natives, and which would arise from the very fact of their being Natives and not Europeans. This may be plain speaking, but such is certainly my personal opinion.

We have only to consider the appointments of the Assay Masters and the Assistants with reference to your Commission, as all the other posts are held by Natives. In doing so I must try and explain somewhat the work and nature of the appointments.

Now in considering the appointment of the Assay Master, I would point out that in England and Europe generally, this post is held and has been invariably held by one of the leading physicists of the day, and a list of these men would represent a roll of distinguished names, names that represent to a large extent the various steps of advance in scientific discoveries. It is not only considered in Europe a fine appointment (one which in London carries with it a large salary, a large house free, no water or gas rates, &c., and various private sources of income from consultations, lectures, &c.), but it carries great weight by reason of the position it gives, and the holder of it is generally appointed as the representative of the Government on scientific committees and commissions. Of course as a rule his name is one of European celebrity before he is appointed, and his opinion would of itself be treated with respect, but it is so well understood that only some man who has distinguished himself is given the appointment, that scientific men of all countries, even if they happened not to know him, would be inclined to accept the opinion as of great importance.

Now it would be a great thing for India if such men could be tempted to come out, and the Government some years ago made some attempt in this direction, but, as it is only natural to expect, such men will not come out. Indeed no pay, nothing would tempt men like Professors Crookes, Roscoe, Roberts, Austin, Percy, Stas, &c., to come out to India to take such an appointment as this, while they would gladly accept a similar one in England.

They would not come out here, where they would have a large amount of routine work to do, where they would be unable to continue their investigations in original research, and where they would be exiled from their own scientific world. Even the men working with them, or under them, of sufficient standing and years for such a post, would not agree to wreck their future by coming out.

The Government of India and Secretary of State feeling that the Assay Master should, however, be a man not only competent to carry on the work, but also one who was above suspicion and who could have no interest, beyond the purely scientific one, in any of the many important questions referred to him, turned to their own services, and decided (as already stated) that Commissioned Officers should hold the appointments, provided they qualified and were reported to be fitted in other personal qualities, and at the same time the Government increased the salary in order to make it worth the while of good men to qualify. As, however, there are only four appointments in India Officers are not always willing to work during a hard earned furlough, or to spend the money necessary, with the uncertainty of passing, followed by a chance of there never being a vacancy for them, and their, therefore, never being employed or getting a return for their money. This may have its drawbacks in that there is generally a paucity of qualified Officers to call on, but on the other hand it is very necessary as a safeguard that only Officers who have some taste for, and some previous knowledge of, the work are likely to attempt qualification. It is indeed desirable that no others should be admitted. In fact I should approve of even a higher standard of qualification being required, and of officers having to visit different mines, refineries, and metal factories and laboratories, both in England and abroad, before they were admitted; but the Government would then have to give them some special allowance, or make some new rule to meet the case, and this they do not see their way to do. At it is, however, I believe the Government at present are thoroughly well served.

The post of Assay Master in India has generally been held by an Indian Medical Officer, in fact with the exception of Major Robinson of the Artillery and myself for many years it has always been held by a doctor. Of course by the ruling of Government there is no reason why it should not be held by any other Commissioned Officer, as long as he is qualified, but as doctors have been through a course of Chemistry before, I suppose they find it easier than others would to procure their certificates while on furlough. In fact both Major Robinson and myself had advantages over the generality of officers in that we possessed previous knowledge of the subjects required. Major Robinson had before he entered the service studied as a doctor, and on retirement took his diploma and practised, and is, I believe, still practising as a doctor; while I, even at school studied Chemistry and science instead of the Latin and Greek taught to most boys, and studied publicly and privately under Professors Atkinson, Bloxam, Hart, Thompson, and in Paris and also in Brussels, in which latter place I resided with a professor simply for the purpose of studying physical science and practice in modern languages. In my own case however having Civil Engineering certificates, I went into the Survey of India, and was not attracted to the Assay Department until 1876, when the Government increased the pay and also the qualifications required. The probability is therefore that the Department will generally be filled by officers of the Indian Medical Department, and by those officers in it who distinguish themselves in chemistry and analytical examinations, &c. The Assay Master is in fact the Metallurgical Examiner to Government, the Adviser of the Mint Master in metallurgical matters, the Check Officer in all matters of fineness of the coinage, and Valuer of Metal brought to the Mint; he is referred to by such Government Departments as the Arsenal, Gun

Carriage, &c., even Clothing Department. Mining companies send ore for analysis to the Assay Master, and he is the referee in questions involving large sums between banks and Government, and between banks and firms, refiners and merchants and goldsmiths, jewellers, &c.

In India there is nothing approaching to hallmarking and there are no Assay Offices except the two Government Offices in Bombay and Calcutta: thus numerous questions are referred that might otherwise not come here. I have known cases of dispute settled at once by reference to the Assay Master, which would otherwise have entailed a law suit, for the simple reason that the parties felt that in the end the judge would have to refer the technical question to this Office; and I have known not only large sums change hands, but actually be returned after having been paid over on an opinion expressed by me, and I find that such opinions are received at home and in other countries on account of their being those of the Assay Master with a respect that I know the individual could hardly claim.

Now I have mentioned these details because I think it necessary to show that the idea of Government has been to raise the standard of Officer they employ as much as possible, and if it could be shown me that in this country there were Natives who showed the same marvellous ability as the great men employed in Europe, combined with the same honesty of purpose, I would allow Government could have no better. But this is not the case.

Now no one can feel more than I do the vast difference between such distinguished men, whose names are of European celebrity, and the Officers the Government of India procure, but I at the same time say that between the capabilities of the latter and the Native there is quite as great, if not greater, difference. It is in fact perhaps one of the most extraordinary things about the education we have so patiently introduced into India that, though there have been turned out a multitude of excellent Clerks and Accountants, fair Solicitors, Barristers, &c., there has not been one man yet who has shown any turn for original scientific research; and that however well or badly they may do in other paths of life yet in scientific experiment, original investigation or discovery, any scientific knowledge they may have acquired has produced absolutely nothing.

Whether this will change with time is another question, but I am certain that an Assay Office, and especially one doing work for the Government Mint and other Government Departments, besides the public, is not the place in which to attempt the experiment of Native fitness.

Again as there are so few appointments in the Department, and as they lie in a line which Natives do not study as a rule, they would not help to any extent in their employments; and as the Government has so lately discussed and arranged the rules for these appointments, I do not myself believe it either wishes to or will open up the subject again.

I now turn to the Assistants and much of what I have said refers in principle to them also.

I have already mentioned the peculiar technical knowledge required on the part of the Assistants, the enormous amount of laboratory work and the furnace work left in their hands, and the implicit trust the Assay Master has to repose in them. When it is remembered what infinitesimal samples we deal with, that we work even in gold and silver to the two thousandth part of a grain, that in valuing large amounts the smallest mistake may affect the result to thousands of rupees, and that in many cases infinitely greater sums, and even matters in commerce of vital importance are concerned, and when it is remembered that should any process be tampered with in any intermediate stage by a man who is up in the work, as an Assistant should be, the consequences would be most serious to Government, the public or individual—I say when the nature of the work is thus fairly considered the responsibility these men have is very great, and their posts are those of great trust.

Again considering that on the Assay Master would fall the disgrace and loss in case of a mistake or wilful falsification, it is but right he should have a voice in the appointments of his Assistants, and I honestly say that for my part I should feel no thorough confidence in Native Assistants even if they were able to do the work properly, of which I very much doubt their capability, scientific accuracy not being their strong point. In fact they might proceed very well as long as everything was plain sailing and the "expected" took place, but I should never feel sure that some "effect" or "reaction," to which my attention ought to have been called, had not been overlooked altogether, nor certain that in case of any thing requiring promptness they would not fail. It would be of no use to swell this report by giving the many examples I could to illustrate what I mean.

Again, among the Native merchants, the agents of Rajahs, Nawabs, &c., jewellers, and such like who come here there would be personal friends or castemen, or some who would have influence on Natives, and the principles of honor among this class are not of a high order. It is not as if I was speaking generally of what I only guess; on the contrary unfortunately we have experience in this matter, and I am sorry to say actions which they look on as sharp appear only too often to me to be absolutely dishonest. Would such men not try to tempt their friends or castemen, the Native Assistants? and would they not have some power over them? and would they not be more likely to succeed with them than with Europeans to whom they would probably not dare to suggest anything.

Indeed some of these Native merchants have strange views. Only a short time ago a man complained to me in a case regarding the purchase of some gold from Calcutta in which he had undoubtedly been swindled. I need not go into all the details, it suffices to say that with the evidence that both the Assay Masters of Calcutta and Bombay were ready to give, the original offender could have been punished, if only the complainant would take steps, and I did all I could to bring this about, but in spite of all this, the merchant who brought the case to me and the intermediate merchants

shielded the cheat, and took money down to somewhat cover their loss; and I believe all along the sufferers had a feeling that they would have been only too glad to have done the same as the rogue if they had had the chance, but they inwardly flattered themselves they would have have been too clever to be found out. I could of course give many instances of curious dealings.

Again the appointment of Natives can be no possible saving, for considering the responsibilities of the post every Assay Master, myself included, has placed on record that he considers the Assistants are at present under paid, and has represented the same to Government. I am therefore perfectly certain that it would be quite impossible to obtain the services of any Native of a character high enough for the post on any lower salary, and indeed I consider that if any Native were found in all respects qualified for the post he would certainly be entitled to draw, and be worth, the full salary.

Finally, I would call attention to the fact that in matters of assay there can be no appeal in this country (or the most that could be would be from one Government Assay Office to the other) as there are no other Assay Offices; and it is not anyhow till the fault or the false report has gone abroad, and the transaction taken place, that the falseness of a certificate would be detected; but even if there were a number of private assay laboratories in the country, as in Europe, I still hold that, as in Europe, the final appeal should be to the office which in competency and character must be above suspicion, and that Office should be the Government Assay laboratory. If a certificate once went abroad or among the public, the correctness of which could be questioned, the public faith in the competency of the Office might be shaken, and if it were a serious case, it might even be a matter of Imperial importance, in that it might raise doubts as to the power of the Officers to even check the coinage.

I would even like to have some way by which I could have a European on probation as it were for the place of Second Assistant; and the Head Clerk's place would do if only the salary were bigger, but as it is no European would take it, and I would like also to be able to send the man being thus trained to England to visit mines, refineries, and works of various character in order that he might see and learn practical matters which he can never see here, and the knowledge of which would be very useful to him in his work.

Regarding the posts of Assay Master and Deputy I presume the Government do not even contemplate a change, having decided that they are to be held by Commissioned Officers, and I sincerely trust they will also make no change as regards the appointment of the Assistants, but leave it as at present to the judgment of the Assay Master to appoint the men he finds, after due investigation and trial, to be best suited for the post; for such a Department as the Assay is one of the very last in which it would be safe to try experiments among appointments. Years hence when the mining works have increased, when the mineral wealth of the country is being scientifically opened up, when the technical and scientific education of the people has spread, there may exist many large and private Assay Offices to meet requirements, and Government may find less difficulty in filling posts, but personally I believe that even then the reports that will be considered most trustworthy will be those from laboratories conducted by Europeans and not by Natives; and that Government will feel more than ever obliged (in the face of the fact that their Assay Master will be as it were the final referee in all courts) to appoint Europeans and not Natives to its own Office.

1	2	3	4						
			Number of appointments in each class or grade now held by—						
Department.	Total number of gazetted appointments or of appointments not being purely clerical of salaries of Rs. 100 and upwards.	Distribution of the gazetted appointments and the other appointments mentioned in column 2 amongst classes and grades, with rate of pay attached to each.	1 Europeans not domiciled in India.	2 Europeans domiciled in India.	3 Eurasians.	4 Natives of India.			
						(a) Hindus.	(b) Mahammadans.	(c) Others.	(d) Total.
Assay	4 (2 gazetted, 2 non-gazetted).	"Assay Master" held by a Commissioned officer, Rs. 1,750 rising to Rs. 2,250.	1	..	..	..	..	..	..
		"Deputy Assay Master" held by a Commissioned officer, Rs. 600 rising to Rs. 1,200.	1	..	..	..	..	..	..
		"1st Assistant to Assay Master," Rs. 300 rising to Rs. 350.	..	1	..	..	..	..	..
		"2nd Assistant," Rs. 150 rising to Rs. 200.	..	1	..	..	..	..	..

Further Note by Major GERALD MARTIN, F.R.G.S., F.C.S., *Assay Master, Bombay.*

Assay Department.

One or two points have arisen in the course of the inquiry which I feel it my duty to notice.

Mr. Couldrey said it was "discouraging to be *superseded* by men who are probably not as many years old as an Assistant is years in the Department."

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Mr. Couldrey has learnt all he knows while in the Laboratory and naturally by now has very much more knowledge than men in his position of life generally have, and especially so in the particular technical details of the office, but this does not for a moment show that he is a fit or proper man for the senior appointment, or that he has anything like the scientific or general education of the Officers hitherto gazetted to the senior appointments or the qualifications considered necessary to such positions.

To take an example of what I mean: a Non-Commissioned Officer cannot be said to be *superseded* by any Officer who is gazetted to a Commission, or again a Hospital Assistant cannot be said to be superseded by a Surgeon.

I do not wish to be misunderstood. I do not say that exceptional men should never be promoted, on the contrary in all walks of life, men at times appear who show marked superiority, and I would be one of the first to help such men if in my power, but I submit that this superiority and fitness for the high position must be shown to exist, and that it is impossible to recognise the principle formulated by Mr. Couldrey, that subordinates can claim a right of appointment (be their length of service what it may) superior to that of qualified and better educated gentlemen.

2. Mr. Couldrey said in his evidence, and I see refers in his written statement to the "Assistants" teaching "Probationers."

I asked him at once what he meant, and if he meant by that expression the carrying out of the orders I at various times give in such cases? and he replied that that was what he meant.

I think, therefore, it is as well to explain this statement clearly.

The Assay Master may, and certainly does when he chooses, order an Assistant at any time to show a Probationer some detail of the work, the manipulation necessary in certain cases, the way to use some instrument, how to "charge" and manage some furnace, and carry out such like technical details. When a candidate has previously been through his course at the School of Mines, he does not require to be shown these things, and it would be better and save the Assay Master much trouble if all gentlemen came on probation after and never before they had obtained their certificates in England; circumstances, however, will not always admit of this.

Again the Assistants may have to prepare such mixtures or samples as the Assay Master may order to be prepared for the probationer to analyse or assay.

If the Assistants were not able to do these things they would be useless as Assistants, and I should have to get other men.

Work of this nature is all my Assistants have ever been ordered or authorized by me to perform with regard to Probationers. It might be better had the Assay Master enough time and liberty not to be obliged to employ Assistants even as much as this; but the Assay Master, it must be remembered, is not in the position of a Professor with a class of students to whom he devotes his whole attention, but is dealing with gentlemen who have already had a scientific education, and who are Probationers and may in certain branches know as much if not more than himself.

It is, however, necessary in all cases that any candidate who is new to the work (never mind how much chemical and metallurgical knowledge he may previously possess) should begin at the commencement and go through every step with his own hands, and we who have been educated in English Laboratories learnt many minor practical details from Laboratory hands, Melters, &c.

This, therefore, does not mean that the Assistants teach the Probationers, for indeed they would be unable to do so, the latter being men of superior education and possessed of far greater general and scientific knowledge.

In fact, to refer to one of the examples in the last paragraph. An Officer on first joining his regiment is put through his drill by the Drill Sergeant, but it does not follow that the Sergeant is fit to be in the Officer's place.

However, to return to the subject of the Probationer. All the scientific, theoretical, and important practical instruction, all the book-work and explanation thereof, the style and course of study, the examination and correction of each item of work done by the Probationer so as to know exactly how he is progressing, and in fact the general conduct of the whole from beginning to end is carried on by the Assay Master himself, and at times if he is busy and unable to attend to it (and Probationers, I confess, are indeed a great additional trouble), the Probationer applies to the Deputy Assay Master. The Final examination both theoretical on paper and practical, extending over some time is arranged, given, and entirely carried out by the Assay Master only. The papers

he sets and the answers obtained are sent to the Government of India with the Assay Master's remarks, and are also sent to the Assay Master at the other Mint to look over independently and state his opinion on them. After this if satisfactory the Confidential report is sent in by the Assay Master under whom the candidate has worked as to his general fitness for employment in the Department apart from mere technical fitness.

3. The next point was a remark made by the Assistant regarding an Officer on probation who had qualified in England.

All I can say is that this remark appears to me unfounded.

An Officer may be perfectly qualified, but may not have done some detail in the work we consider necessary, and the object of the period of probation is just to give the Officer the opportunity to perform these minor details that they may have omitted at home. I am, however, bound to confess that though I of course know the Officer referred to in such a personal way, I do not remember that he ever made such a statement as that mentioned, and to me it is hard to believe that the Professor of the Royal School of Mines and Chemist of the Royal Mint would state that certain instruction had been given if it was not so; yet this is what the evidence implied, although the witness could not possibly have seen the certificates that are sent to the Secretary of State.

4. Another point I would notice is that Mr. Couldrey says "during the past four years four Probationers have been *employed* in the Assay Department."

This statement may mislead the Commission into thinking that four Officers who had not obtained the certificates required by Government had been *employed* in the Department. This is not the case. In 1883, when I was still Deputy Assay Master, and Surgeon-Major Graham was Assay Master, I was sent home at three days' notice on sick leave, and Surgeon-Major Graham telegraphing the circumstances to Simla received permission, as a temporary measure, for Dr. Thompson, then a Probationer, to act.

No other Probationer has been employed in the Department.

During the present year, my Deputy Assay Master Surgeon-Major Yeld wished to go on leave, and I applied for the services of Surgeon Milne, M.B., F.C.S., &c., who had completed his period of probation under me, and whom I knew to be an exceptionally able man and who was about to be relieved of the appointment of Chemical Examiner to Government in which he had been officiating; but owing to a paucity of Officers his services could not be spared, and Surgeon-Major Yeld was in consequence not permitted to go on leave. Thus one Probationer only has been employed as a temporary measure, and the services of one other have been asked for, but not obtained. There have been Officers on probation, *i.e.*, studying, but that is a very different thing from saying that they were employed.

5. In Mr. Couldrey's written evidence he gives certain figures. I have not been through them carefully, but it appears to me there is an error in them, as regards the cost to Government. As the Probationers are Officers, they are only allowed to go on probation when their services can be spared, and only draw their substantive pay, which they would equally draw if they were not on probation.

In some cases when a man comes from an up-country station to act for another here, there will be the difference in cost due to the Presidency house allowance while the latter is on probation; and there may also at times be the sum due to the difference in salaries of men acting for one another, and which can only occur when the probationer is holding some Civil appointment carrying a special salary of its own; but as the Officers who come on probation are generally young men, this seldom is of any consequence.

6. I feel with regard to the next point that it is perhaps hardly necessary I should make any remark, but after that which occurred I am not sure that it would be right in me or just to the Officers concerned to allow the matter to pass entirely without notice.

The following are the Officers who have entered the Department since 1876, and I think it needs no words from me, as the list speaks for itself, and I submit gives names of which the Department has no reason to be ashamed. Indeed these my brother Officers in the Department are not only men who have had a scientific training and proved their knowledge in the schools, one indeed being a Gold Medalist and having taken high honors in Chemistry and Science, but they are gentlemen of attainments, culture, travel and experience;—

Surgeon Edis, M.B., F.R.C.S. (This Officer is dead.)
Major Gerald Martin, F.R.G.S., F.C.S., Assay Master, Bombay.
Surgeon-Major Scully ("London" I think), Assay Master, Calcutta.
Surgeon-Major Yeld (Edinburgh), Deputy Assay Master, Bombay.

The three last-named Officers are those at present substantively appointed to the Department. They did not put in their probation in Bombay, they are all senior men, over 40 years of age, and being therefore as old as Mr. Couldrey, do not come under the head of men "of as many years of age as he has service."

7. As regards *candidates* for the Assay Department, there is at present only one Officer who has obtained all the necessary certificates, viz., Surgeon F. Reeves of the Madras Medical Service, and he is now officiating as Deputy Assay Master in Calcutta.

There are other young Officers who have put in their six months' probation in Bombay and have passed satisfactorily, but have not yet been able to go home to procure the necessary certificates in England, *i.e.*, such as Surgeon Thompson already mentioned as having officiated and Surgeon Milne. I may mention that Surgeon Milne is an officer who has taken the highest honors in Chemistry and is a gold medalist, he has held the officiating appointment of Chemical Examiner to Government on two occasions, also Professor of Chemistry at the Grant Medical College and Elphinstone College. He will of course have no difficulty in passing when in England and obtaining his certificates at the Royal School of Mines and Royal Mint when able to obtain leave.

What I wish to point out, however, is that Government not only does not procure incompetent Officers, but is on the contrary well served, and that it would not be in the interests of Government or the Public, to promote subordinates of but little education, in place of appointing gentlemen such as I have named.

I think it might be as well that I should call attention to the fact that the object of Government in laying down that Officers must have a certificate from the Normal College of Chemistry, another from the Royal School of Mines, another from the Chemist and Assay Master of the Royal Mint, and finally put in a six months' probation in one of the Indian Assay Offices, before being substantively appointed, is to insure having the services of qualified men.

It is not, I understand, supposed that a man without previous knowledge could pass through the necessary courses and examinations in the given time, and these regulations, therefore, are in the nature of a test and not supposed to be the only instruction received.

Government also lays down that the mere passing of the required tests will not be considered sufficient to entitle an Officer to appointment, unless in other respects (apart from technical fitness) he shall be considered a proper person to hold the position.

8. I in no way wish to be hard on the Assistants and, as I before stated, I think they are far better educated men than men in their station of life generally are. I have often endeavoured, and so have those before me, to better their prospects and to get their salaries increased to the same as some of the Assistants and Mechanics in the Mint, and particularly so because they would find much difficulty in obtaining employment in any other Department after their peculiar training. I submit, however, that they are not fit men to be put in the senior appointments, and if such men once hold them it would be a backward and fatal step; for only men of the same stamp, or perhaps not as good, would consent to serve under them. If these men are eligible for promotion to the senior appointments, there will be no Subordinate Department at all and the tone of the whole Department will be lowered.

9. Before leaving the subject of the higher appointments, I would again call attention to what I said before. The Government some years ago saw the necessity of having the best men they could obtain as Assay Masters. Now these posts in other countries are held by men having a European reputation. Such men it was found would not come to India to be exiled from the world of scientific thought and to be hampered in their original investigations and labors of research.

The Assay Master is the guardian of both the Government and Public interest in matters regarding the value of bullion and fineness of the coinage, and is the metallurgical adviser of the Mint Master. He is the referee between the Mint Master and the Bankers and Merchants; he is at times consulted by Bankers, Refiners and Merchants in cases of contracts, and his opinion is sought by various Government Departments, such as the Gun Carriage, Clothing, &c., his reports guiding them in the choice of a "tender" or as to whether a contract has been fairly carried out. Large Firms, Mining Agencies, Travellers, small Merchants and Goldsmiths refer various questions of Metallurgical interest and pecuniary importance to him. I have known large sums change hands, moneys refunded and law suits saved by an opinion expressed by the Assay Master. Bankers and Merchants have expressed their opinion most clearly and forcibly to me to the effect that the office of Assay Master should be held by a man whose position is such that his report can be unquestioningly accepted as accurate and wholly unbiassed.

In England, besides the Government Assayers, there are many private firms doing the work; but in India there are only the two Government Offices of Bombay and Calcutta.

Under these circumstances it is but right that Government should be anxious to have men who are both duly qualified and above suspicion.

It was with this idea that Government decided to turn to their own Officers, and at the same time to insist on certain qualifications, and it was with this idea that the Secretary of State's order was issued saying "that only Commissioned Officers, as a rule, shall be appointed."

Covenanted Civilians are not likely to take up such an appointment, and men who have been educated solely in India have not had the chance of studying the subjects necessary.

I do not therefore see what other course Government can take than that already followed.

I do not suppose for one moment that Government would hesitate to appoint such men as Professors Percy, Jevons, Graham, Stas, Levol, &c., if they could get such men to come and indeed they would be only too glad to command the services of men like these; but it is a very different thing when one turns to look for suitable men in India.

It is probable that Doctors will, as hitherto, generally hold these appointments (Major Robinson and myself being, I believe, the only two exceptions since 1829), and this is to be expected, as among them there are always a certain number of men who have done well in Chemistry and can take up the subjects with ease and are therefore good and capable men and quite the proper Officers for the appointment. In fact, as the orders at present stand, the Government have reserved to themselves

the right to appoint any specially good man, Covenanted or Uncovenanted, if they think fit, although it is said that as a general rule they will be Commissioned Officers, and indeed as long as the services of young Officers like Surgeon Milne and others can be obtained, I think Government would not be wise to change the present order, which, while it leaves them free of any absolute promise is yet satisfactory, secures efficiency and is perhaps safest in this country both for them and the public.

10. To conclude, I would also briefly refer to the subject of the employment of Natives. First, with regard to the Senior appointments.

I submit that our system of education in this country has not yet produced (at least not to my knowledge) any Native with any high scientific attainments, or who has shown any aptitude for original work. At present there is no School of Mines in the country and no way in which Natives can obtain the instruction necessary.

What I have said, however, of other gentlemen must of course apply to some extent here.

When there is a qualified Native gentleman of the proper class and standing, *i.e.*, a man whose character, position, birth, caste and learning justify his appointment, there appears no reason why he should not be appointed, provided (and this is more important than it at first appears) that his signature to various certificates will be equally acceptable among the Public, Bankers, Merchants, in England and the Colonies and on the Continent.

Such a Native, I think, should also receive the full salary, for he would be well worth it.

I would, however, remind the Commission of one thing more, and in doing so I do not wish to be unjust, and, I only mention it as a matter worth the consideration of gentlemen who have Indian experience.

There are in European countries many private Assayers, and among them are many names carrying great weight, but all are not equally good, and the Government Assayer is looked on not only as a highly qualified man, but from his position unbiassed and disinterested. Now in India there are no Assay Offices except those of the Government of India at Bombay and Calcutta, and I cannot help thinking that, with a Native Assay Master, certain Merchants (especially the smaller Native Merchants) would show distrust, and it would hardly be desirable that the Government Assay Master, who is responsible for the fineness of the country's currency, should be continually defending himself against various charges that might at last cause general want of confidence. Years hence this might not be the case, but I am sadly afraid that, for some time to come, there would be considerable danger of such a state of things, that is, until some Native gentlemen have taken up such work as a profession and gained the confidence of the public.

Secondly, as regards Natives as Assistants. I am of opinion that the stamp of Native we should be likely to get for such places would not be such as I should have entire confidence in. It is perhaps possible to indicate the reason for this. Trustworthy men are necessary, but Natives of fairly good position, supposing they had enough knowledge to start with to enable us to teach them and make them good Assistants, do not take kindly to the manual labor attached to the posts, and thus we are driven to choose from a very ignorant class of men, or a not very trustworthy class. This may all change in time, but at present the better class of Natives, and in fact nearly all who can pass any examination, however easy, seem to prefer employment of a less technical kind.

I need not enter into this more fully here, it suffices to say that my opinion is formed after over 20 years' service in India and after living among Natives of all classes in almost all parts of the country (except the Madras Presidency), and finally from what I have seen myself of the temptations and peculiar positions in which such men would be placed in an Assay Office. I see in my position here the cheating that is attempted between petty merchants, and I know also the bribery that would be attempted.

It must, however, be remembered that in any case, say of a false certificate or even a wrong Assay, that it is the Assay Master himself who suffers and he only. It is not the Government and it is not the Assistant, but it is the Assay Master whose name is gone and who, if not eventually condemned as a rogue, would yet be ruined for life and be at least considered careless, ignorant and incompetent with a cloud of doubt hanging over his honor.

Thus the Assay Master should surely be considered in this matter, and if he prefers Europeans then let him have them, but if he prefers Natives let him have them. It will probably, however, be best to postpone appointing Natives until such time as a Native gentleman has been found fitted and been appointed as Assay Master, when he would be able to choose his own Assistants and select a Native to fill a vacancy if he preferred to have one, though I myself honestly confess I doubt even a Native gentleman doing so without most careful investigation—investigation such as no European could make. When that time comes the Department will of course gradually change and eventually there would be no Europeans in it at all. Would this be advantageous? I think not.

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Section III.

Sittings at Calcutta.

Witness No. I.—23*rd March* 1887.

Examination of Lieutenant-Colonel R. S. RIDDELL, R.E., Mint Master.

Colonel R. S. Riddell.

I am the sole gazetted officer in the Mint Department, Calcutta.

There are several appointments in my department not gazetted, of which the salary exceeds Rs. 100 per mensem. The First Assistant, who receives a salary of Rs. 450 rising to Rs. 600 per mensem, is, and must in my judgment be, a European. He and the Bullion-Keeper, who is, and should be, a Native, have joint charge of all the bullion, and check mutually every transaction entailing the receipt, transfer or issue of bullion. The Bullion-Keeper receives a salary of Rs. 500 per mensem and has to find security in Rs. 1,50,000. I say he should be a Native because no one except a Native would find such security when receiving a salary of Rs. 500 only.

The Head Mechanical Engineer, on Rs. 500 to 600 per mensem, is a European. I have not found any Native with sufficient qualifications to deal with a great deal of machinery of which some is very delicate and some very complicated. There are six other Engineers, of whom about half were recruited in England. I would take men in India when vacancies occur if I could obtain them sufficiently qualified. The Head Engraver was with difficulty procured in England. He is a Belgian, and receives a salary of Rs. 500 rising to Rs. 600. All the subordinate Engravers are Natives. The Head Engraver must be a designer as well as a skilled workman.

Except where the employment of men of two races to check one another conduces to the security of the large interests with which the Department is charged, I am of opinion that there are no reasons for disqualifying any Native, or any European or Eurasian born in India, for employment in the Department, provided the possession of adequate technical knowledge and probity is assured.

Witness No. II.—23*rd March* 1887.

Examination of Surgeon-Major JOHN SCULLY, Assay Master.

Surgeon-Major Scully.

I am the Head of the Assay Department of the Calcutta Mint. There are two gazetted appointments in that Department, the Assay Master and Deputy Master. Both are held by Commissioned Officers.

The duties of an Assay Master are (1) to determine the fineness of all gold and silver bullion tendered to the Mint, and (2) to ascertain that the fineness of the coin is maintained at the standard prescribed by the Coinage Act. The Resolution of the Government of India, as to the persons to be appointed Assay Master, is dated the 12th May 1876. The qualification and education required of an Assay Master are prescribed by a Resolution of the Government of India, No. 3570, Financial, dated 19th September 1884. I have only one European now domiciled but not domiciled by birth in the Assay Department, the Second Assistant on a salary of Rs. 150 rising to Rs. 200. The First Assistant is a European born in India of parents domiciled therein. He receives a salary of Rs. 300 rising to Rs. 350. The rest of the establishment is clerical or menial. There is no objection to the employment of Natives in my Department whether pure Asiatic, Eurasian, or domiciled European, provided they are qualified and of approved honesty, and there are no rules excluding any class.

Sittings at Bombay.

Witness No. III.—20*th July* 1887.

Examination of H. COULDREY, Esq., Head Assistant, Assay Department.

H. Couldrey, Esq.

The *President.*

When did you join the Department?—In 1861 as Second Assistant. I joined from school, having had no previous technical training and being only fourteen-and-a-half years old. I may say I was educated in the Department. I entered on Rs. 50; the present pay of the appointment is Rs. 150 to 200. I was twelve years second Assistant. I have been fourteen years Head Assistant. The salary of my present post is Rs. 300 rising to Rs. 350, and I have just attained the maximum salary after twenty-seven years in the department.

Are you aware that at one time considerable difficulty was experienced by Government in filling appointments in this Department?—I know there was a correspondence about it, but could never see the reason for it.

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On what particular points do you wish to give evidence?—The point on which I desire to offer evidence is that the Uncovenanted Assistants in the Assay department can perform efficiently, and to the satisfaction of Government, the duties of the appointments from which they are now practically excluded by the resolution of Government, No. 124, dated 12th May 1876 *(reads)*.

It cannot but be admitted that officers of 26 and 14 years' experience who are repeatedly called upon to instruct probationers for the higher grades in the Assay Office must be qualified to perform the work which they are able to teach others, and if a six months' course of study (the time allowed by Government) under their instruction is sufficient to qualify candidates for the position of Deputy Assay Master, surely the Assistants who have been in the Department for years, and are familiar with all its workings, and have taught the candidates all they know on the subject of assay, have very strong claims, and it comes therefore as a great hardship, and is most discouraging to be superseded by men who are probably not as many years old as an Assistant has served years in the Department, only because the Assistant is a member of the Uncovenanted Service.

Had Uncovenanted Officers been proved unfit for the higher posts in the Assay department after a fair trial, there would not have been a grievance, but the fact stands out that the only Uncovenanted Officer admitted into the department has fully justified the selection made in appointing him.

I submit that long, faithful, and efficient service on the part of Uncovenanted Assistants should have prior claims to promotion, especially as the training in the Department is really and truly a technical and scientific one, and there does not appear to be any reason why the higher appointments in the Department should be held by commissioned Military and Medical Officers, when in no country in the world that I am aware of are similar appointments reserved exclusively for commissioned officers.

Probationers after passing the departmental examination are eligible for employment as Deputy Assay Masters, and may be employed in the Department for a period not exceeding 12 months without a Home certificate. During the past four years four probationers have been employed in the Bombay Assay Office alone at a cost of about Rs. 12,000, three of whom have passed the departmental examination, but judging from present appearances are never likely to enter the Department on the permanent list. The last probationer, a Medical Officer, drew Rs. 900 a month and Rs. 75 house allowance, but did not complete more than half his course, as the exigencies of the service required his return to his substantive appointment, so that in his case nearly Rs. 3,000 have been absolutely wasted. Moreover, although a probationer may pass his examination, he may be declared unfitted for the Department, not from any want of ability, but simply because the Assay Master in the confidential report called for by the Government of India reports unfavorably of him. I therefore submit that the present system of recruiting the department is unnecessary and extravagant.

That the employment of Uncovenanted Officers in the higher grades of the Assay department will not be detrimental to the interests of Government and the public has been established by the Assay Master's report, No. 11 of the 21st April last, addressed to you, from which I have been allowed to make the following extracts:—

"The two Assistants are Europeans of the Uncovenanted Service and are not gazetted officers, but are appointed by the Assay Master. There being only two appointments, a vacancy rarely occurs; for example, my Senior Assistant is in his twenty-seventh year of service, and my Second Assistant has completed sixteen years.

"The Assay Master on first appointing men to such positions has to be guided by the qualifications necessary for such posts—posts, as I show further on, of very considerable responsibility and requiring peculiar technical and special knowledge in the holders. The men must be of high character, so that they can be implicitly trusted, and from the nature of the work required to have had a sound education and to possess certain scientific knowledge, including a knowledge of Chemistry and Metallurgy, and be men who will not be satisfied with the mere fact of having obtained an appointment and thus carry on the daily routine portion of it regularly without further interest, but who will be men anxious to advance in scientific knowledge and take a keen intellectual interest in the various scientific and metallurgical questions that arise at different times."

* * * *

"It must be evident from what I have shown above to be the nature of the work carried on by the Department how very important the work is that the Assistants have to perform, and what great responsibility is attached to their posts. The carrying out of the various processes required by the Assay Master in the laboratory falls to their hands and requires special scientific knowledge and training; questions requiring the utmost care, forethought and delicacy of treatment depend on them. A mistake might be of great moment, not only to the Assay Master, but to the Government or public. Again, receiving, as they do, the various precious articles and specimens brought for assay, being, as they are, in a position of trust in matters in which the interests of the very men who present these things are seriously involved, a position in which with the knowledge possessed they would be able very seriously to affect results,—I say, considering all this, it is evident that, should one of the Assistants be anything but a perfectly upright, straightforward man and above temptation, the consequences would be very serious. It is therefore most important that the Assistants should be men who have had a sound education, who possess special chemical and metallurgical knowledge, and who enjoy such a character that an Assay Master can fearlessly, confidently, and implicitly trust them."

* * * *

"I have already mentioned the peculiar technical knowledge required on the part of the Assistants, the enormous amount of laboratory work and the furnace work left in their hands, and the implicit trust the Assay Master has to repose in them. When it is remembered what infinitesimal samples

we deal with, that we work even in gold and silver to the two-thousandth part of a grain, that in valuing large amounts the smallest mistake may affect the result to thousands of rupees, and that in many cases infinitely greater sums and even matters in commerce of vital importance are concerned, and when it is remembered that should any process be tampered with in any intermediate stage by a man who is up in the work, as an Assistant should be, the consequences would be most serious to Government, the public or individual, I say, when the nature of the work is thus fairly considered, the responsibility these men have is very great and their posts are those of great trust."

It is apparent from the above that the most important work of the Department (such as analyses, assays of ore, &c.), is entrusted to, and performed by, the Assistants, and it can therefore hardly be fair that the men possessing the qualifications necessary to discharge such duties, and having served the Government in the department for so many years, should, notwithstanding repeated appeals made on their behalf by different Assay Masters, receive salaries less than those of 2nd-class Engineers in the Mint, and considerably less than half of the salaries drawn by men holding corresponding appointments in the Mint Master's office.

In almost every other Department of the Government Service—for example, the Post Office, Secretariat, Accountant-General's, Public Works (Accounts Branch), &c.—ministerial officers are as a reward for meritorious and efficient service, promoted to gazetted appointments, and consequently to salaries infinitely higher than those drawn by the Assistants in the Assay Office.

In conclusion, I would like to add that Assistants who have served a lifetime in the Assay department are completely handicapped in the race for life, as the very nature of their duties unfits them in a great measure for employment in other Departments, and they are therefore deserving of every consideration on the part of Government.

Has not the present Assay Master represented that your pay is insufficient?—He has, and so has the late Assay Master more than once.

What is the course which is pursued with regard to the metal used in coinage in this country?—It first goes to the Mint, where its quantity is ascertained, a sample is sent to the Assay Office for assay; about half a rupee's weight, representing probably a mass of 15,000 tolahs, is sent to the Assay Office to be reported upon. At the assay, a sample of little more than 18 grains of it is weighed by a person called the "Rough Weighman," from whom it goes to the Fine Weighman, who weighs it as accurately as possible, and from him to the Assay Master who checks the weight and puts it in a bottle. All the work until it reaches the Assay Master is done by Natives. The silver is then dissolved in nitric acid, the solution diluted, and the silver precipitated by the addition of hydrochloric acid. The bottles being filled with water are inverted in troughs so as to remove the chloride of silver, which is collected in pots. The water is then poured off by the Assistants, and the pots are taken to the drying furnace, and thence to the Assay Master, who weighs the chloride. The Assay Master sends a report to the Mint Master. With so many different processes performed by different persons, it cannot be said that any one person makes the assay.

Does the work which is done by the Deputy Assay Master differ at all from that done by the Assay Master?—No, that is to say he weighs the silver as silver and weighs it out as chloride. My argument is that an Assistant who can teach a probationer to perform the duties which are required of him as Deputy Assay Master must be able to perform them himself, and as our Assistants are repeatedly called upon to instruct probationers, as I myself have instructed them in several cases, I see no reason why Assistants should not be appointed to the position of Deputy Assay Masters.

Major Martin.

You mean to say that you show the probationer certain manipulation in the laboratory?—I teach him the work of a Deputy Assay Master, which is simply to weigh the silver at the balance as silver and to turn it out as a chloride.

By "teach," you mean that you are asked by me to show him portions of the regular Assay work of the Assay Office and you do it?—We teach him to use the balance also. I contend that the education he receives in the Assay Office during his six months' probationary course fits him for the position of Deputy Assay Master. He comes to the Department without any previous knowledge or aptitude; he has to be taught everything in the Department.

The *President.*

He probably knows something of Chemistry?—Elementary Chemistry only. Only one of the probationers who have entered the Department has passed in inorganic chemistry. They admit themselves that they know nothing about it.

Suppose in the course of your analysing you met with a result which you had not expected, and which was contrary to your former experience, would chemical knowledge be required to explain the difficulty?—Yes. The Assistants are the persons who have to make the analyses of metals.

Supposing you have a metal sent to you apparently of a certain nature, say gold or silver, but which, when tested by the tests usually applied in the Mint, gives results with which you are not familiar?—Under these circumstances, we would have to seek the information elsewhere.

But if you had a more complete knowledge of Chemistry, would it be necessary to apply elsewhere?—We have a sufficient knowledge of Chemistry. Such a difficulty as you suggest might arise, but we have never met with it yet, and I should think the intelligence of the Department was quite equal to dealing with it if it occurred. I do not think it is absolutely necessary that the Assay Master and the Deputy Assay Master should know more than the rudiments of Chemistry.

You have met with no difficulties which might not have been solved by a person possessing an elementary knowledge of Chemistry?—No.

The Hon. Khan Bahadur *Kazi Shahbudin.*

Have you any objection to the Rules of 1884 except that they interfere with the promotion of officers in your position?—No. My objection to

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them is that they practically exclude Uncovenanted Assistants from the higher grades of the Department.

The *President.*

There has been one Uncovenanted Officer in the higher grades of the Department, has there not?—Mr. Peterson—Deputy Assay Master in the Calcutta Mint?—Yes.

He qualified in England, did he not?—Yes; and we are prepared to qualify.

The Hon. Khan Bahadur *Kazi Shahbudin.*

Is it possible for a man to be a good Assay Master without the qualifications laid down in these rules?—Quite possible.

Attendance at a three months' course of Inorganic Chemistry could be done in India?—Certainly.

Is such a training necessary?—Yes.

Attendance at the Royal School of Mines or a course of Metallurgy, could that be had here?—No, we have no such school here.

Attendance at an Assay Laboratory, could not that be done just as well here?—Yes.

So all that is wanting to make a complete course of training possible in India is a School of Mines?—Yes.

The *President.*

Have you anything further to add?—I wish to add that one of the gentlemen who came out to the Department from England, certified to possess all the qualifications laid down in the rules, was actually taught his work by the Assistants in the Department.

The Hon. Khan Bahadur *Kazi Shahbudin.*

In your opinion, is it necessary that every candidate for employment in the Assay Department should visit England?—For that one purpose—to acquire a knowledge of Metallurgy.

Is there any reason why the gazetted appointments in this Department should be restricted to Covenanted Officers?—No, unless it be the exclusion of the Uncovenanted Service.

Are there any opportunities for the commission of frauds or defalcations in the Department?—For the commission of frauds, yes.

Are any precautions taken against such frauds?—Yes, the silver, as it comes in, is received by a responsible officer and weighed by a Weighman under him in the presence of three or four others. He does not know who owns the silver, so that all inducement to fraud appears to be absent. In the case of private work we take the very best precautions we can, that is to say, I personally receive every sample that comes into the office and lock it up until it is given out to be weighed.

Are any precautions taken beyond trusting to the character of the officer who receives the silver?—No.

Do you see any objection to the employment of Natives in this Department if qualified?—That question could be better answered by the Assay Master. My own experience is that Natives have not the necessary qualifications. I have only had experience of one Native in the Assay Office, and I may say his work was most unsatisfactory in more ways than one; but as the man is dead the less said about the matter the better.

Do you infer from this solitary instance that Natives as a class are unfit for appointments as Assay Officers?—I do not think the technical training required is such as Natives could master. Chemistry, no doubt, they could manage, but it would be in Practical Metallurgy where they would fail. A Native has no aptitude for practical work.

Mr. *Nulkar.*

Are you aware that the Government employs an officer as Chemical Analyser in Bombay, and that he has a Native Assistant who assists him materially?—Yes, but he is not required to be exact to the millionth part of a grain.

I wish also to add that an Assistant Assay Master who must be an Accountant, a Corresponding clerk, a Metallurgist and an Assay Officer, if necessary gets only half the salary of an officer who performs only one of these duties in the Mint Master's Office.

You entered the Department not having been trained for it in any way?—Yes.

And you qualified yourself while in the Department for these appointments which are denied to you?—Yes.

Those who hold those appointments have to qualify themselves at their own expense?—Without any cost to Government, certainly.

I suppose you are aware that very few Natives get Rs. 50 at the age of fourteen?—Perhaps they have not the same acquirements. I had to compete in general knowledge with about fifty other candidates for my first appointment.

If a Native passed the same examination, passed through the same grades, and had the same opportunity of learning the work, do you mean to say he would not be equally qualified?—I do not see why he should not be.

Mr. *Fernandez.*

Where were you born?—At Nagar.

Have you been to Europe?—Yes on two occasions—for twelve months in 1872 and for two years in 1880-81.

Why did you not take the opportunity to pass through the School of Metallurgy?—Simply because the Government had issued the Resolution of which I complain.

Would it have cost you much to have gone through that course?—Not £15.

The *President.*

You said just now that a gentleman who brought out from England certificates of having the necessary qualifications for service in the Department had to be taught his work in the Department?—Yes.

He was acquainted with Chemistry, was he not?—He was supposed to have passed in Inorganic Chemistry.

He had also passed the examination at the Apothecary's Hall?—He may have done so.

In point of fact was he not wanting only in a knowledge of the particular method of assay which is practised in Bombay?—I go further; I say

he came out on a certificate which supposed him to be capable of making an assay of ores; he never assayed an ore, and was incapable of doing so. He was supposed to know how to make an assay of mint-sweepings; he had never heard what mint-sweepings were. He held a certificate under the Government Resolution qualifying him to be an Assay Master in the Indian Mints, and to a simple question "Have you ever heard of or assayed mint-sweepings?" he was unable to say that he had. And yet he was supposed to have have had one month at the Royal Mint, and the term "mint-sweepings" is a familiar one to every aspirant for employment in the Mint Department; because the Royal Mint issues a certificate that he is able to assay mint-sweepings. Then as to Metallurgy, he had never made an assay of ore in his life, though he was supposed to have gone through a three-months' course of Metallurgy at the School of Mines. I say that these certificates are quite unnecessary and that they serve no purpose of the Department.

Do you get any overtime allowances?—Yes, but their amount is small.

And receive fees for private work?—Yes, the whole perhaps come to Rs. 100 a month.

Witness No. IV.—20*th July* 1887.

Examination of Major MARTIN, F.R.G.S., F.C.S., Assay Master.

Major Martin.

The *President.*

Is there any good reason for the condition that the Assay Master should be a Covenanted Officer?—It originated in the desire of the Supreme Government to raise the standard of Assay Masters. In 1876 I was in England and was consulted on this very matter, and I know the desire was if possible to get men for the Indian Mints who should be of the same standing and hold the same position as other Assay Masters in England, who, of course, are men of European celebrity. But of course men of that class could not be expected to leave England to go where they would be exiled from all scientific thought; there was nothing to tempt men of that character to do so. Therefore the only alternative which should secure our having men of social station and education for the Indian Mints was to appoint members of the Covenanted or Military Services who were already in the country. I may say that the reason for the selection of Medical Officers was that such officers are usually possessed of chemical knowledge to begin with, and Medical Officers have generally held the Assay appointments.

Why do you consider it necessary that the Assay Master should be a gentlemen of the social standing of a Commissioned Officer?—Because in the first place he is a referee between the Government and the public, between the Mint and the Banks. I quite allow that the very fact of his being Assay Master gives him that position and therefore it is that the Government has to take care that the person who holds that position is of a certain social standing. With reference to this question of social status, I may add that the Government requires that the Assay Master should report on the general aptitude, independently of technical knowledge, of a probationer, and on one occasion my report was returned because I had not sufficiently gone into the question of social status.

Do you consider that the Assistant Assay Masters possess sufficient technical knowledge to be Deputy Assay Masters?—No; they would be deficient in point of general education.

Do Natives conduct chemical analyses with as much accuracy as Europeans?—I have had no experience of them in my office in that respect, but I believe there are Natives in the Chemical Examiner's Office. If you mean Natives in the position of Assistants to the Assay Masters, I say decidedly not. In the first place, I do not consider that the necessary chemical knowledge or scientific knowledge generally is obtainable in India. In the next place the position in which the Assay Masters are is a very peculiar one. The mercantile community which brings gold to us—I do not, of course, refer to Banks or large firms—does not, I think, adopt a standard of morality which would induce it to refrain from holding out offers to Natives in the Department which they would be capable of resisting.

As regards their technical knowledge?—They would have to be supervised. You see Natives are employed by us now absolutely and solely for mechanical work. Ten years ago, we had a Native in the Department. I know nothing about him personally, but judging from the reports he was not a success.

The Hon. Khan Bahadur *Kazi Shahbudin.*

Do you say that that single instance justifies you in pronouncing all Natives unfit for service in the Department?—No.

Are you aware that the Assistant Chemical Examiner to Government is a Native graduate, and that his work is of some responsibility, that the life of an accused person may sometimes depend on his report?—Yes.

Have you any objection to Natives being admitted as Assistants?—Yes. As an Assay Master I object to them, as I should not feel I was able to trust them. I know the peculiarities of such men and the style of men we should get.

The *President.*

I understand you to say that you would not recommend the employment of Natives as Assistants to the Assay Master because you think they would be of a class you could not implicitly trust, having regard to the fact that they would be brought into relations with a class of merchants who would hold out certain temptations to them. Whether they would be otherwise fit to be Assay Masters, you cannot say, because at present you think there is no Native of India who has received the education which would qualify him for the post?—Yes.

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Witness No. V.—20*th July* 1887.

Examination of Major-General J. H. White, R.E., Mint Master.

Major-General White, R.E.

The *President.*

How is it that while in Calcutta this Department employs an Engraver on Rs. 600, apparently the same officer in the Bombay Mint only gets Rs. 150?—I believe the Calcutta Engraver, who is a Belgian, is a man of higher attainments altogether, and is capable of designing and cutting dies—a thing very few Natives can do. Natives, as a rule, are only skilful in certain kinds of die-cutting; they can follow lines, but not faces and figures. The man we have in Bombay answers our purpose remarkably well, and we should have great difficulty in replacing him, but he is not capable of doing the high-class work which I understand the Calcutta Engraver does.

Is it necessary that the Foreman of the Mechanical establishment of your Department should be a European?—I think so, until mechanical training is very much more extended in India. It is very essential also that he should be a man capable of commanding others, and who has had extensive experience in a workshop.

Your Foreman corresponds with the Mechanical Engineer in the Calcutta Mint?—I believe so.

What are his duties?—He superintends the work throughout the establishment. These men have, as a rule, served in the Department for years and acquired their skill there.

Your Superintendent of Coining is a European also?—Yes. The post involves considerable mechanical training. It does not follow because he is styled Head of the Coining department, that he works in that department. We shift them from one to the other.

How is it you have not more Natives as Superintendents of departments?—The class has not yet come forward in this country.

You have a very large number of Natives in the subordinate departments?—A very large number. We should be very glad indeed if we could get a Native Mechanical Engineer capable of superintending a large body of men and accurate in his work. Accuracy of work is another thing in which a Native fails.

Are you acquainted with the mechanical workshops in Bombay?—I have seen the Railway workshops very frequently. They employ a very large number of European Superintendents, and have not yet learnt to dispense with them.

Have they not very competent Native foremen?—That is a different class altogether. The Native foreman may be a very good man, but unable to superintend large bodies of workmen. A good Mahomedan—a man with some force of character—might do so.

Who sets up the machinery in the large mills here?—There are, I believe, good Parsi Engineers, but I fancy a great deal of the machinery in the Bombay Mills has been set up by Europeans. I have seen the difference between European and Native workmen, and, without being prejudiced, I say it is very difficult indeed to find a Native who has sufficient experience and accuracy to set up any at all complicated machine and keep it in proper order. A good European Engineer takes enormous pride in the condition of his engine, and would never allow it to run down. I should doubt whether the Native Engineers in Bombay are as particular in that respect as they ought to be.

You see no objection to the employment of Native Engineers?—Not if you can obtain them with the necessary qualities.

Have you ever attempted to get them from the Poona College of Science?—No.

Is there a Department for Mechanical Engineers at that College?—I think so.

Mr. *Nulkar.*

You know that many Parsis are employed by Railway Companies as Drivers and that they are responsible for their own engines, and have not yet been found fault with for keeping their engines in a worse state than European Drivers keep theirs?—You will find good men amongst them, but they are not so neat in their work.

You say the work done by the Calcutta Engraver is of a class which cannot be done in Bombay. Who does that class of work in Bombay?—If any one applies to me for a medal of any difficulty, I recommend him to apply to a firm at home as I think it can be done more cheaply at home than here. I have no desire to see a highly-paid Engraver here. The Native we have here is cheap at the price. I suppose that if they could have got a competent Native in Calcutta, they would have done so. They must have more difficult work than we have or they would most probably employ a local Engraver.

Witness No. VI.—21*st July* 1887.

Examination of Captain Hext, R.N., Director of Indian Marine.

Captain Hext, R.N.

The *President.*

You have charge of the Government dockyards here and at Calcutta?—Yes.

And have had considerable experience of Native and European workmen in India?—Yes, from my position as head of the dockyard.

Are the Superintendents of the various branches of your shops Europeans or Natives?—The head men are Europeans.

I believe you have effected very considerable reductions in the cost of dockyard expenditure?—I trust I have.

And are endeavouring to effect still further economies?—Yes.

Has it occurred to you to substitute Natives for Europeans as heads of the different branches of the dockyard?—It is impossible, for the reason that, no matter how good a Native is, he does get no opportunity of seeing and adopting the newest improvements. For instance, we had in Bombay for many generations men of whom I can hardly speak too highly—the Parsi master ship-builders. No men could have done better service to the State than they did in their day; but still these men, doing as well as they ever could have done, have never had the opportunity of going to Europe constantly every four or five years, and the constant experience of modern developments which is necessary. Take another Department—boiler-making. Natives had done admirable work as makers of boilers of 30-lb. pressure. A boiler was required to bear 90-lb. pressure. The Native workmen thought they could not construct it, and said so. They were compelled to try and they succeeded, and then they were quite pleased.

Have you turned out any large castings in this country?—We have had some fairly large ones to do. The other day in Calcutta the main shaft of one of our ships broke short off. I decided to try and cast one. The Native workmen said it was impossible. Luckily we had the Head Boiler Maker from the Admiralty and we tried it, and the interest shown by the Natives was something remarkable. The head maistry threw up his hands and said it was impossible, but he was compelled to try and the moment he put his back to it, he did it. You must have men who have constantly been to Europe every three or four years to see the latest improvements, otherwise they would not know what machinery to order out; the Heads of the Departments do not know. It is not that Natives cannot be made fit, but they have not the opportunities for becoming so.

Are Native workmen economical in their use of material?—Most certainly they are not. That is their worst point in a dockyard; and another of their faults is their unpunctuality. If an order came to me for repairs to a ship to be completed on the 1st of August, for instance, the odds are twenty to one the work would not be completed by the 21st August owing to some small circumstance cropping up which the Native workmen had not foreseen. It is a very awkward thing to promise, in Departments like the Mint for instance, plates at a certain time, and to be unable to fulfil your engagement. As regards waste of material, I have seen first-class timber indented for by the heads of the Departments and paid for at Rs. 140 per ton. First-class timber must be of a certain length, and while the actual quality of the wood remains the same, the price is regulated by length, and short logs would cost less than half the price of logs of extraordinary length; yet I have seen first-class timber cut into short lengths for which a much cheaper timber would have sufficed, immediately it came into the yard. The price of the timber was paid and received by Government, so there was no loss to the Crown, but there was unnecessary waste and if the timber had been purchased in the market or the cost had been charged to a private purchaser, the loss would have been serious. The defects of Native workmen arise from the circumstance that they are not up to modern requirements. They are not acquainted with modern methods, and do not appreciate the necessity for the economical use of material.

If a technical school were established, do you think we could train Natives to the same degree of efficiency as the English workmen attain in the Clyde workshops?—There is one thing against it which is that your technical school does not give you the practical experience. This can be obtained only at large industrial centres.

Do you know whether large private establishments, like that of Messrs. Richardson and Cruddas, employ Natives as Superintendents?—I do not.

I suppose that in such an establishment a man could acquire very fair technical knowledge?—Yes. Because the partners in the firm, when they come out from home, bring with them the latest experiences. I have some Native smiths in the workyard now who can do as neat a piece of work as any smith in England, but when they get any heavy work to do, they fail completely,—I suppose because they have not the strength for it.

Witness No. VII.—21*st July* 1887.

Examination of R. M. Nicol, Esq., Engineer Superintendent, British India Steam Navigation Company's Dockyard, Bombay.

R. M. Nicol, Esq.

The *President.*

I believe you have acted in the same capacity in the Company's yard at Calcutta also?—Yes.

Where were you educated?—In Greenock and received my technical education in Shaw's Water Foundry, where I was trained as a Marine Engineer for a period of six years. William McNab and Co. were the proprietors of Shaw's Water Foundry.

Did you pay any premium for learning the business?—No. I signed an agreement to be trained in Marine Engineering under a penalty of £40.

Did you work without any remuneration?—No; during the fourth year I had 2*s.* 6*d.* a week, and during the sixth year 8*s.*

Is it customary for men in your profession in England to undergo an apprenticeship without receiving much remuneration?—In Scotland it is.

When you completed your apprenticeship, did you continue to work in Scotland or come out at once to India?—I continued to work in Scotland, and when I left, it was to go to Spain. On my return from Spain, my next journey was to France, and after that to Italy, and then I came here.

Were these journeys for special work?—I was sent out as a guarantee man in charge of the

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machinery on board steamers. I came to India in 1875 in the service of the B. I. S. N. Company. I was engaged at home, and have since continued in the service of the Company.

In the workshops of which you have charge, is any Native employed on a salary of Rs. 100 ?—No.

It appears from your pay list that there are several appointments which carry salaries over Rs. 100 ?—Yes, my Assistant is a native of Scotland; the next man is a Eurasian on Rs. 150 and overtime allowances; the foreman of the Coppersmiths' shop is a European trained in England; the foreman of the boiler-makers' shop is a European trained at Greenock.

The Head of each department under you is a European ?—Yes.

What is your opinion of Natives as Mechanical Engineers ?—That they are very good workmen.

How is it they do not rise to these superintending appointments ?—They have been trained with us to repairing work and have no knowledge of design or construction and are quite unused to the responsibility of planning out even a repair. My own experience is that they are not capable of giving instructions for repairs without supervision, and that they are wanting in resource. I do not know whether it is owing to their previous training or not, but that is what my experience leads me to.

Would it not be more economical to employ Natives than Europeans as Superintendents ?—Certainly not.

Why not ?—Because they would require to receive instructions from some one more capable than themselves.

Are they economical in the use of materials ?—No, that is one of their chief faults. Take, for instance, boiler-making; if you wanted half-a-dozen plates, they have no idea of laying down a design to begin with as to the size of the plates required so as to cut to waste the smallest quantity of material. They would take a measurement, and without hesitation cut two or three feet from the plate without thinking whether the work might not have been so arranged as to avoid this. Whereas a man properly trained would first of all design the work; he would find out what size of plate he wanted, in laying on the plates he would study the position of his bearings or base, and would order his material accordingly. Again, you may have in store a plate of 12 feet by 4. In my own experience, I have known a Native take that plate and cut 3 or 4 feet of it without regard to the waste he was making, not having to pay for the material. Not being trained in design, he could not arrange his work.

I believe you entertain a very high opinion as to the ability of Natives to turn out fine work ?—Yes As machinists they are excellent, owing to the fineness of their touch. As little boys of nine or ten years of age, they are capable of screw cuttings, can select their own wheels, and are most neat in their work. They do that kind of work very well indeed.

Do you think if a good technical training institution was established men of the class who serve under you might be trained to become competent Supervising Engineers ?—You would have, in the first place, to bring them up to self-reliance, as a boy at home is brought up to depend on himself. The misfortune of this country is that boys depend so much on others.

Are you aware that it was formerly the custom of the country for Native workmen to work independently of each other ?—Yes; and they do so yet.

And they had to make their own designs. Is it the case that none of the class of men who have been used to work independently are capable of the self-reliance you speak of ?—I have never had any experience of those men. They find it more remunerative to make contracts on their own account.

Do you get Eurasian and Native apprentices in your sheds ?—We have European and Eurasian, but no Native, apprentices.

How do Eurasians answer as Engineers after going through an apprenticeship ?—We have one or two that have turned out very capable men.

We were told in Calcutta that your Company had ceased to employ Eurasians as Engineers at sea ?—When we have nobody else we have to fall back upon them.

Do you know what were the disqualifications which attached to them ?—They had no resource. The fault of their bringing up has been that they have always had some one to wait on them, and they seem to think the same thing should follow them in every path of life. As junior Engineers on a ship they require more attendance from firemen and Engineers than a European just beginning would. An apprentice at home is trained to think and act for himself to a great extent.

How far are they reliable men in their work ?—We have two Eurasian Chief Engineers.

Have you found them pretty careful men ?—I myself would prefer a European. He has more resource. Their great failing as a class comes from their depending on other people, and again when an accident occurs, failing to tell the truth, and in the majority of cases trying to hide the accident. One such case came under my own notice in Calcutta; on a ship arriving the Chief Engineer, a Eurasian, sent in his report in which he declared the ship to be in a state of most perfect order. The ship's certificate had expired and she required a fresh survey. She was opened up and the boiler and machinery surveyed with the exception of the low pressure cylinder, as to which the Chief Engineer was asked if the piston inside was in perfect order, and he told the Engineer Surveyor it was. Later on I received a note from the Engineer saying that the piston rod of the Engine was bent, and on examination I found it was so, and asked him if he could account for it. He said he could not and that it was very strange, "very mysterious." I told him there was nothing mysterious about it, there must be some mechanical reason for it, and that it was his duty to have reported it.

Did you subsequently ascertain the cause of the accident ?—After the expiration of two days whilst the repairing was going on the Chief Engineer was informed that it involved his possible dismissal from the engine-room staff unless the cause of the accident was made known. He then admitted that the guard had come off the top of the piston and had lodged between the top and the cylinder cover and bent the rod.

What had become of it?—It had fallen into a condenser. The Chief Engineer had not taken the trouble to find out what had become of it. A more careful man would have reported when he arrived that he had lost this guard, and, had he been well up in the construction of his engines, would have found out where the guard had fallen. That is only one instance. With Eurasian Engineers it is a favorite plan of getting out of what they call trouble to say they cannot account for an accident.

They are not very careful men?—No.

Do you consider Natives of this country take such care of fine machinery as Europeans educated at home?—My experience in Calcutta leads me to say no. Cleanliness is the first thing they object to. A machinery man or a turner works his lathe but he never thinks of scraping off the dust and dirty oil when he has done with it. A machine soon goes to waste under such treatment.

Do you know whether many educated Natives in Calcutta or Bombay take to mechanical Engineering?—Not in Calcutta.

Does Scotland, in proportion to its population, contribute more largely to mechanical Engineers than any other part of the British Empire?—There are a large number of Scotch Engineers.

I believe in Scotland you have very good cheap public schools?—Yes, one of the privileges we have retained is that the cost of education is not excessive. Three pence a week at one time was considered a sufficient fee for education at a good school.

The Hon. Khan Bahadur *Kazi Shahbudin.*

Are there any public institutions in England or Scotland for giving technical training to youths —especially in Mechanical Engineering?—Not in Scotland, except evening classes, so far as I know.

Where is this mechanical Engineering training received generally?—In the Engineering yards of private firms.

What time does it usually take a boy to become a Mechanical Engineer?—Five years, on an average. He enters the yard generally at the age of fifteen or sixteen. He binds himself to the proprietor of the firm to serve for five years, and the proprietor binds himself to teach him the different branches of Marine Engineering. No premium is required.

At the close of your apprenticeship, you were free to get employment where you could?—As a rule, when a boy receives back his indentures, he shifts to another place.

How is the world to know the qualifications of an apprentice after he has left the yard?—A certificate that he has served his apprenticeship is granted him, and his qualifications are easily ascertained in practical work. I have worked in the same yard with the sons of Professors, highly-trained men, and they worked with their own hands much the same as the ploughman's son did.

Their parents are required to pay a premium?—I have never known a premium paid in any part of Scotland.

Who defrays the expenses of their board?—They get a room in a respectable family, and they pay for their own board. Their wages are not sufficient to pay for it.

Suppose a boy breaks his indentures?—He forfeits the amount mentioned as a penalty, and is sometimes sent to complete his apprenticeship in jail.

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Shri Brihad Bhartiya Samaj

on 31 October, 2019

PROCEEDINGS

OF THE

SUB-COMMITTEE,

PUBLIC SERVICE COMMISSION.

OPIUM DEPARTMENT.

BENGAL:

SECTION I.—NOTE BY THE SUB-COMMITTEE.
„ II.—NOTE BY THE DEPARTMENTAL MEMBER.
„ III.—SITTINGS AT CALCUTTA.
„ IV.—LETTER FROM OPIUM DEPARTMENT.

BOMBAY:

SECTION I.—NOTE BY THE SUB-COMMITTEE.
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